



Public Comment Guidelines

To provide a fair opportunity for public input, the ISFMP Policy Board has approved the following guidelines for use at management board meetings:

For issues that are not on the agenda, management boards will continue to provide opportunity to the public to bring matters of concern to the board's attention at the start of each board meeting. Board chairs will use a speaker sign-up list in deciding how to allocate the available time on the agenda (typically 10 minutes) to the number of people who want to speak.

For topics that are on the agenda, but have not gone out for public comment, board chairs will provide limited opportunity for comment, taking into account the time allotted on the agenda for the topic. Chairs will have flexibility in deciding how to allocate comment opportunities; this could include hearing one comment in favor and one in opposition until the chair is satisfied further comment will not provide additional insight to the board.

For agenda action items that have already gone out for public comment, it is the Policy Board's intent to end the occasional practice of allowing extensive and lengthy public comments. Currently, board chairs have the discretion to decide what public comment to allow in these circumstances.

In addition, the following timeline has been established for the **submission of written comment for issues for which the Commission has NOT established a specific public comment period** (i.e., in response to proposed management action).

1. Comments received three weeks prior to the start of a meeting week (October 17) have been included in the briefing materials.
2. Comments received by **5:00 PM on Tuesday, November 1** will be included in supplemental materials.
3. Comments received by **10:00 AM on Friday, November 4** will be distributed electronically to Commissioners/Board members prior to the meeting.

The submitted comments must clearly indicate the commenter's expectation from the ASMFC staff regarding distribution. As with other public comment, it will be accepted via mail and email.

Final Agenda

The agenda is subject to change. The agenda reflects the current estimate of time required for scheduled Board meetings. The Commission may adjust this agenda in accordance with the actual duration of Board meetings. Interested parties should anticipate Boards starting earlier or later than indicated herein.

Sunday, November 6

4:00 – 7:00 p.m. Registration

Monday, November 7

7:00 a.m. – 1:00 p.m. Registration

9:00 – 9:30 a.m. **Atlantic Herring Management Board**

Member States: Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey

Other Members: NEFMC, NMFS

Chair: Ware

Other Participants: Brown, Zobel

Staff: Franke

1. Welcome/Call to Order (*M. Ware*)
2. Board Consent
 - Approval of Agenda
 - Approval of Proceedings from August 2022
3. Public Comment
4. Update on New England Fishery Management Council's (NEFMC) 2023-2025 Specifications and NOAA Rulemaking Timeline (*E. Franke*)
5. Set Quota Period for the 2023 Area 1A Fishery (*E. Franke*) **Final Action**
6. Consider Vacant ASMFC Seat on NEFMC's Atlantic Herring Committee (*M. Ware*) **Action**
7. Other Business/Adjourn

9:30 a.m. – Noon **Habitat Committee**

Members: Ayvazian, Babb, Bachman, Boltin, Carloni, Chiarella, Chintala, Coakley, Colarusso, Dippold, Enterline, Fay, Fournier, Hense, Johnson, LaFrance, Laney, McTigue, Medders, Peabody, Rousseau, Schneider, Sherwood, Smith, Topolski, Vanderbilt, Wilber, Wilke

Chair: Johnson; Babb (Vice-Chair) serving as Chair for this meeting

Other Participants: Madley, Yepsen

Staff: Havel

1. Welcome/Call to Order (*R. Babb*)
2. Board Consent
 - Approval of Agenda
 - Approval of Meeting Notes from May 2022

3. Atlantic Coastal Fish Habitat Partnership Update (*L. Havel*)
4. Northeast Regional Habitat Assessment Update (*J. Coakley, M. Bachman*)
5. Bluefish Benchmark Stock Assessment Habitat Section Update (*L. Havel, K. Wilke*)
6. Status Updates (*L. Havel, C. Enterline, R. Babb*)
 - Habitat Management Series: Acoustics
 - *Habitat Hotline Atlantic*
 - Fish Habitats of Concern
7. Recess

9:45 – 11:45 a.m.

American Lobster Management Board

Member States: Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland, Virginia

Other Members: NMFS

Chair: McNamee

Other Participants: Perry, Reardon, Beal

Staff: Starks

1. Welcome/Call to Order (*J. McNamee*)
2. Board Consent
 - Approval of Agenda
 - Approval of Proceedings from August 2022
3. Public Comment
4. Update on North Atlantic Right Whale Court Cases
5. Review Annual Data Update of American Lobster Indices (*K. Reardon*)
6. Consider Next Steps on Draft Addendum XXVII on Increasing Protection of Spawning Stock Biomass of the Gulf of Maine/Georges Bank Stock (*C. Starks*) **Possible Action**
7. Update from Work Group on Implementation of Addendum XXIX on Electronic Vessel Tracking for Federal Permit Holders (*C. Starks*)
8. Discuss the Trap Transfer Tax for the American Lobster Fishery (*D. McKiernan*)
9. Progress Update on Jonah Crab Benchmark Stock Assessment (*J. Kipp*)
10. Consider Fishery Management Plan Reviews and State Compliance for American Lobster and Jonah Crab for 2021 Fishing Year (*C. Starks*) **Action**
11. Other Business/Adjourn

11:45 a.m. – 12:45 p.m. Lunch Break (*on your own*)

12:45 – 2:45 p.m.

Atlantic Coastal Cooperative Statistics Program Coordinating Council

Partners: ASMFC, Connecticut, Delaware, District of Columbia, Florida, Georgia, MAFMC, Maine, Maryland, Massachusetts, NEFMC, New Hampshire, New Jersey, New York, NMFS, North Carolina, Pennsylvania, PRFC, Rhode Island, SAFMC, South Carolina, USFWS, Virginia

Chair: Carmichael

Staff: White

1. Welcome/Call to Order (*J. Carmichael*)
2. Council Consent
 - Approval of Agenda
 - Approval of Proceedings from May 2022
3. Public Comment
4. Consider FY2023 Project and Administrative Proposals for Funding for Approval (*J. Simpson*) **Action**
5. Consider Atlantic Recreational Implementation Plan for Approval (2023-2027) (*G. White*) **Action**
6. Program and Committee Updates
7. Elect Vice-Chair **Action**
8. Other Business/Adjourn

1:15 – 4:00 p.m.

Habitat Committee (continued)

8. Reconvene
9. East Coast Climate Change Scenario Planning Update (*T. Kerns*)
10. Species Assignments Check-In (*R. Babb, T. Kerns*)
11. Overview of Climate Resiliency Work in New Jersey (*M. Yepsen*)
12. Aquaculture Update from NOAA Greater Atlantic Regional Fisheries Office (*K. Madley, M. Bachman*)
13. Elect Chair and Vice-Chair **Action**
14. Other Business/Adjourn

2:00 – 5:00 p.m.

Registration

3:00 – 5:30 p.m.

Atlantic Striped Bass Management Board

Member States: Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, North Carolina

Other Members: DC, NMFS, PRFC, USFWS

Chair: Gary

Other Participants: Blanchard, Celestino, Nelson

Staff: Franke

1. Welcome/Call to Order (*M. Gary*)
2. Board Consent
 - Approval of Agenda
 - Approval of Proceedings from August 2022

3. Public Comment
4. Consider 2022 Atlantic Striped Bass Stock Assessment Update **Possible Action**
 - Presentation of Stock Assessment Report (*G. Nelson*)
 - Consider Management Response (if necessary)
5. Consider Draft Addendum I on Quota Transfers for Public Comment (*E. Franke*) **Action**
6. Review and Populate Advisory Panel Membership (*T. Berger*) **Action**
7. Other Business/Adjourn

6:00 – 7:30 p.m. Welcome Reception

Tuesday, November 8

7:00 a.m. – 1:00 p.m. Registration

9:00 – 10:30 a.m. Shad and River Herring Management Board

Member States: Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, Florida

Other Members: DC, NMFS, PRFC, USFWS

Other Participants: Neilan, Burrell, German

Chair: Davis

Staff: Boyle

1. Welcome/Call to Order (*J. Davis*)
2. Board Consent
 - Approval of Agenda
 - Approval of Proceedings from May 2022
3. Public Comment
4. Consider Approval of American Shad Habitat Plan Update (*B. Neilan*) **Action**
 - Massachusetts Taunton River Addition
5. Consider Approval of River Herring Sustainable Fishery Management Plan (SFMP) Updates (*B. Neilan*) **Final Action**
 - Massachusetts Nemasket River Update and Herring River Addition
 - Maine SFMP Addendum
6. Update on the 2023 River Herring Benchmark Stock Assessment (*K. Drew*) **Action**
 - Approve Draft Terms of Reference
 - Approve Stock Assessment Subcommittee Membership
7. Presentation of NOAA River Herring Habitat Conservation Plan (*B. German*)
8. Review and Populate Advisory Panel Membership (*T. Berger*) **Action**
9. Other Business/Adjourn

9:00 a.m. – Noon

Law Enforcement Committee

(A portion of this meeting will be a closed session for Committee members only)

Members: Beal, Blanchard, Brown, Burrell, Cloyd, Couch, Gadowski, Henry, Hettenbach, Hodge, Hogan, King, Marek, Moore, Moran, Noel, Pearce, Rogers, Simmons, Snellbaker, Thomas, Walker, Williams

Chair: Snellbaker

Staff: Kerns

1. Welcome/Call to Order (*J. Snellbaker*)
2. Committee Consent
 - Approval of Agenda
3. Public Comment
4. Introductions
5. Review and Discuss Vessel Tracks Agency Interface (*J. Simpson*)
6. Update on Changes to Enforceability Guidelines (*J. Snellbaker*)
7. Review and Discuss Commission Species (as needed)
8. State Agency Reports
9. Recess

10:45 a.m. – 12:15 p.m. Coastal Pelagics Management Board

Member States: Rhode Island, New York, New Jersey, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, Florida

Other Members: NMFS, PRFC, SAFMC

Other Participants: Giuliano, Hodge

Chair: Cimino

Staff: Franke

1. Welcome/Call to Order (*J. Cimino*)
2. Board Consent
 - Approval of Agenda
 - Approval of Proceedings from May 2022
3. Public Comment
4. Update on 2022 Spanish Mackerel Stock Assessment and Peer Review (*J. Carmichael*)
 - Presentation of 2022 Stock Assessment Update to Date
 - Presentation of 2022 Stock Assessment Peer Review Report and Response from the South Atlantic Fishery Management Council
5. Review Differences Between Interstate Fishery Management Plan (FMP) and Federal FMP for Spanish Mackerel (*E. Franke*)
6. Consider Fishery Management Plan Reviews and State Compliance for the 2021 Fishing Year (*E. Franke*) **Action**
 - Spanish Mackerel
 - Atlantic Cobia
7. Other Business/Adjourn

12:15 – 1:30 p.m. **Lunch Break** *(on your own)*

1:15 – 5:00 p.m. **Atlantic Coastal Fish Habitat Partnership (ACFHP) Steering Committee**
Members: Babb, Beal, Boltin, Campfield, Carloni, Chiarella, Coakley, DeLucia, Dippold, Duncan, Faulkner, Fournier, Groskin, Johnson, Kornbluth, Laney, McMunigal, Medders, Moore, Powell, Rousseau, Schneider, Smith, Thomas-Blate, Topolski, Tweel
Chair: Smith
Staff: Havel

1. Welcome/Introductions *(K. Smith)*
2. Committee Consent
 - Approval of Agenda
 - Approval of Minutes from July 2022
3. Overview of ACFHP in the Next Few Months *(K. Smith, P. Campfield, L. Havel)*
4. Wrap Up and Overview of Day 2
5. Recess

1:00 – 5:00 p.m. **Law Enforcement Committee (continued)**
(A portion of this meeting will be a closed session for Committee members only)

10. Reconvene
11. State Agency Reports (continued)
12. Review and Discuss Ongoing Enforcement Activities **(Closed Session)**
13. Other Business/Adjourn

1:30 – 5:00 p.m. **Climate Change Scenario Planning Initiative Workshop**
Facilitator: Jonathan Star, Scenario Insight

1. Introduction, Background, and Purpose of Workshop *(J. Star, T. Kerns)*
2. Description and Discussion by Scenario
 - Do you agree with/recognize the challenges, opportunities, and possible actions for each scenario?
 - What else is important to note about each scenario that is not yet covered? What would you add?
3. Polling Questions
 - Which scenario is closest to describing the situation as you see it today?
 - Which scenario do you believe is most likely to play out by 2042?
4. Public Comment
5. Recurring Ideas and Main Takeaways
 - Looking across all scenarios, what issues emerge that require further discussion?
 - Cover each of the management themes in turn: cross-jurisdictional governance, data and science, alternative ocean uses, adaptability

- Are there any issues (outside the four theme areas) that we should also include in further conversations (e.g., Summit)?
6. Key Discussion Topics for the Summit
 - What are the big questions that this conversation raises for ASMFC that you would like to see addressed at the Summit?
 - What are the questions this raises for East Coast fishery management in general (i.e., all Councils/Commission) that you'd like to see addressed at the Summit?
 - What specific recommendations would you propose be considered at the Summit?
 - As we prepare for the Summit, what should the Core Team be mindful of?
 7. Public Comment
 8. Adjourn

2:00 – 5:00 p.m. Registration

**6:30 – 8:30 p.m. Annual Dinner at McLoone's Pier House
1 Ocean Avenue North, Long Branch**

Wednesday, November 9

8:00 – 10:00 a.m. Executive Committee

Breakfast will be available at 7:30 a.m. (A portion of this meeting may be closed for Committee members and Commissioners only)

*Members: Abbott, Bell, Burgess, Cimino, Clark, Davis, Fegley, Geer, Gilmore, Keliher, Kuhn, McKiernan, McNamee, Miller, Patterson, Rawls, Woodward
Chair: Woodward
Staff: Leach*

1. Welcome/Call to Order (*S. Woodward*)
2. Committee Consent
 - Approval of Agenda
 - Approval of Meeting Summary from August 2022
3. Public Comment
4. Review and Consider Approval of FY2022 Audit (*J. Cimino*) **Action**
5. CARES Act Update (*R. Beal*)
6. Review Draft *De Minimis* Policy (*T. Kerns*)
7. Future Annual Meetings Update (*L. Leach*)
8. Other Business/Adjourn

9:00 a.m. - Noon ACFHP Steering Committee (continued)

6. Reconvene
7. Strategic Plan Discussion (*L. Havel*)
 - Review Current Draft of Strategic Plan
 - Consensus on Objectives, Strategies, Order, and Language
8. Recess

10:15 – 11:15 a.m.

Business Session

Member States: Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, Florida

Chair: Woodward

Staff: Beal

1. Welcome/Call to Order (*S. Woodward*)
2. Board Consent
 - Approval of Agenda
 - Approval of Proceedings from May 2022
3. Public Comment
4. Consider Approval of 2023 Action Plan (*S. Woodward*) **Final Action**
5. Elect Chair and Vice-Chair **Action**
6. Other Business/Recess

11:30 a.m. – Noon

Coastal Sharks Management Board

Member States: Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, Florida

Other Members: NMFS

Chair: Bell

Other Participants: Willey, Thomas

Staff: Colson Leaning

1. Welcome/Call to Order (*M. Bell*)
2. Board Consent
 - Approval of Agenda
 - Approval of Proceedings from May 2022
3. Public Comment
4. Set Specifications for 2023 Fishing Year (*D. Colson Leaning*) **Final Action**
5. Consider Fishery Management Plan Review and State Compliance for 2020 Fishing Year (*D. Colson Leaning*) **Action**
6. Other Business/Adjourn

Noon – 1:30 p.m.

Captain David H. Hart Award Luncheon

1:30 – 5:00 p.m.

ACFHP Steering Committee (continued)

9. Reconvene
10. Action Planning 2023-2024 (*K. Smith, L. Havel*)
11. Wrap Up and Overview of Day 3 (*K. Smith*)
12. Recess

1:30 – 5:30 p.m.

Atlantic Menhaden Management Board

Member States: Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, Florida

Other Members: NMFS, PRFC, USFWS

Chair: Bell

Other Participants: Newhard, Kersey, Lapp

Staff: Boyle

1. Welcome/Call to Order (*M. Bell*)
2. Board Consent
 - Approval of Agenda
 - Approval of Proceedings from August 2022
3. Public Comment
4. Consider Addendum I to Amendment 3 on Commercial Allocations, Episodic Event Set Aside Program, and Incidental Catch/Small-scale Fisheries for Final Approval **Final Action**
 - Review Public Comment Summary (*J. Boyle*)
 - Review Advisory Panel Report (*M. Lapp*)
 - Consider Final Approval of Addendum I
5. Set Specifications for 2023 Fishing Year **Final Action**
 - Review Technical Committee Report of Stock Projections (*J. Newhard*)
6. Other Business/Adjourn

Thursday, November 10

9:00 – 11:30 a.m.

Horseshoe Crab Management Board

Member States: Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, Florida

Other Members: NMFS, PRFC, USFWS

Chair: Clark

Other Participants: Ameral, Couch, Hoffmeister, Sweka

Staff: Starks

1. Welcome/Call to Order (*J. Clark*)
2. Board Consent
 - Approval of Agenda
 - Approval of Proceedings from August 2022
3. Public Comment
4. Consider Addendum VIII on Implementation of Recommended Changes from 2021 Adaptive Resource Management (ARM) Revision and Peer Review Report for Final Approval **Final Action**
 - Consider Public Comment Summary (*C. Starks*)
 - Consider Advisory Panel Report (*B. Hoffmeister*)
 - Consider Final Approval on Addendum VIII

5. Set 2023 Delaware Bay Harvest Specifications **Final Action**
 - Review Horseshoe Crab and Red Knot Abundance Estimates and ARM Model Results (*J. Sweka*)
 - Set 2023 Specifications (*C. Starks*)
6. Review and Populate Work Group to Review Best Management Practices for Handling Biomedical Collections (*C. Starks*) **Action**
7. Consider Fishery Management Plan Review and State Compliance for 2021 Fishing Year (*C. Starks*) **Action**
8. Other Business/Adjourn

9:00 a.m. – Noon ACFHP Steering Committee (continued)

13. Reconvene
14. Action Planning 2023-2024 (continued) (*K. Smith, L. Havel*)
15. Wrap Up and Discuss Next Steps (*K. Smith*)
16. Adjourn

11:45 a.m. – 2:15 p.m. Interstate Fisheries Management Program Policy Board

(Includes a 30-minute lunch break in the hotel)

Member States: Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, Florida

Other Members: DC, NMFS, PRFC, USFWS

Chair: Woodward

Staff: Kerns

1. Welcome/Call to Order (*S. Woodward*)
2. Board Consent
 - Approval of Agenda
 - Approval of Proceedings from August 2022
3. Public Comment
4. Executive Committee Report (*S. Woodward*)
5. Review Draft *De Minimis* Policy (*T. Kerns*) **Possible Final Action**
6. Committee Reports
 - Habitat (*L. Havel*) **Possible Final Action**
 - Atlantic Coastal Fish Habitat Partnership (*L. Havel*)
 - Law Enforcement (*T. Kerns*)
7. Progress Update on Ongoing Stock Assessments (*K. Drew, J. Kipp*)
 - Black Drum
 - Black Sea Bass
 - Bluefish
 - Spiny Dogfish
8. Review Noncompliance Findings (if necessary) **Action**
9. Other Business/Adjourn

2:15 – 2:30 p.m. Business Session (continued)

7. Reconvene
8. Consider Noncompliance Findings (if necessary) **Final Action**
9. Other Business/Adjourn

Atlantic States Marine Fisheries Commission

Atlantic Herring Management Board

November 7, 2022

9:00 – 9:30 a.m.

Hybrid Meeting

Draft Agenda

The times listed are approximate; the order in which these items will be taken is subject to change; other items may be added as necessary.

- | | |
|---|-----------|
| 1. Welcome/Call to Order (<i>M. Ware</i>) | 9:00 a.m. |
| 2. Board Consent | 9:00 a.m. |
| • Approval of Agenda | |
| • Approval of Proceedings from August 2022 | |
| 3. Public Comment | 9:05 a.m. |
| 4. Update on the New England Fishery Management Council's 2023-2025 Specifications and NOAA Rulemaking Timeline (<i>E. Franke</i>) | 9:15 a.m. |
| 5. Set Quota Period for the 2023 Area 1A Fishery (<i>E. Franke</i>) Final Action | 9:20 a.m. |
| 6. Consider Vacant ASMFC Seat on the New England Fishery Management Council's Atlantic Herring Committee (<i>M. Ware</i>) Action | 9:25 a.m. |
| 7. Other Business/Adjourn | 9:30 a.m. |

The meeting will be held at The Ocean Place Resort (1 Ocean Boulevard Long Branch, NJ; 732.571.4000) and via webinar; click [here](#) for details

MEETING OVERVIEW

Atlantic Herring Management Board

November 7, 2022

9:00 a.m. – 9:30 a.m.

Hybrid

Chair: Megan Ware Assumed Chairmanship: 08/22	Technical Committee Chair: Renee Zobel (NH)	Law Enforcement Committee Representative: Delayne Brown (NH)
Vice Chair: Vacant	Advisory Panel Chair: Jeff Kaelin (NJ)	Previous Board Meeting: August 2, 2022
Voting Members: ME, NH, MA, RI, CT, NY, NJ, NMFS, USFWS (9 votes)		

2. Board Consent

- Approval of Agenda
- Approval of Proceedings from August 2022

3. Public Comment – At the beginning of the meeting public comment will be taken on items not on the agenda. Individuals that wish to speak at this time must sign-in at the beginning of the meeting. For agenda items that have already gone out for public hearing and/or have had a public comment period that has closed, the Board Chair may determine that additional public comment will not provide additional information. In this circumstance the Chair will not allow additional public comment on an issue. For agenda items that the public has not had a chance to provide input, the Board Chair may allow limited opportunity for comment. The Board Chair has the discretion to limit the number of speakers and/or the length of each comment.

4. Update on the New England Fishery Management Council's 2023-2025 Specifications and NOAA Rulemaking Timeline (9:15-9:20 a.m.)

Background

- In September 2022, the New England Fishery Management Council (NEFMC) voted on a 2023-2025 specifications package for Atlantic herring to be submitted to NOAA Fisheries (**Briefing Materials**).
- The Board will consider setting 2023-2025 specifications when a final rule is published by NOAA Fisheries.

Presentations

- Overview of the NEFMC 2023-2025 specifications by E. Franke

5. Set Quota Period for the 2023 Area 1A Fishery (9:20-9:25 a.m.) Final Action

Background

- Per Amendment 3 ([section 4.2.3](#)), quota periods shall be determined annually for Area 1A using bi-monthly, trimester, or seasonal quota periods.
- For the current 2022 fishing year for Area 1A, the Board adopted a seasonal quota approach with 72.8% available June-September, and 27.2% available October-December.

Presentations

- Overview of Amendment 3 quota period system by E. Franke

Board actions for consideration at this meeting

- Set quota periods for the 2023 Area 1A fishery.

6. Consider Vacant ASMFC Seat on the NEFMC Atlantic Herring Committee (9:25-9:30 a.m.)**Background**

- The ASMFC seat on the NEFMC Atlantic Herring Committee is now vacant with the retirement of Commissioner Ritchie White.
- The ASMFC seat was added to the NEFMC Committee in 2018.

Board actions for consideration at this meeting

- Select ASMFC representative to the NEFMC's Atlantic Herring Committee.

7. Other Business/Adjourn (9:30 a.m.)

Atlantic Herring Technical Committee Task List

Activity Level: Medium

Committee Overlap Score: Medium

Committee Task List

While there are no Board tasks for the TC at present, there are several annual activities in which TC members participate, both through the Commission and NEFMC

- Participation on ASMFC PRT/PDT
- Participation on NEFMC PDT
- Summer/fall collection of spawning samples per the spawning closure protocol
- Annual state compliance reports are due February 1

TC Members

Renee Zobel (NHFG – Chair), Kurt Gottschall (CT DMF), Dr. Matt Cieri (ME DMR), Micah Dean (MA DMF), JA Macfarlan (RI DEM), Rich Pendleton (NY DEC), Matthew Heyl (NJ DEP), Jamie Cournane (NEFMC), Jonathan Deroba (NOAA NEFSC), Carrie Nordeen (NOAA)

**DRAFT PROCEEDINGS OF THE
ATLANTIC STATES MARINE FISHERIES COMMISSION
ATLANTIC HERRING MANAGEMENT BOARD**

**The Westin Crystal City
Arlington, VA**

August 2, 2022

These minutes are draft and subject to approval by the Atlantic Herring Management Board.
The Board will review the minutes during its next meeting.

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These minutes are draft and subject to approval by Atlantic Herring Management Board.
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INDEX OF MOTIONS

1. **Move to approve agenda** by Consent (Page 1).
2. **Move to approve proceedings of October 18, 2021** by Consent (Page 1).
3. **Motion to adjourn** by Consent (Page 16).

These minutes are draft and subject to approval by the Atlantic Herring Management Board.
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ATTENDANCE

Board Members

Megan Ware, ME, proxy for P. Keliher (AA)	Eric Reid, RI, proxy for Sen. Sosnowski (LA)
Steve Train, ME (GA)	Justin Davis, CT (AA)
Cheri Patterson, NH (AA), Chair	Bill Hyatt, CT (GA)
G. Ritchie White, NH (GA)	Sen. Craig Miner, CT (LA)
Dennis Abbott, NH, proxy for Sen. Watters (LA)	James Gilmore, NY (AA)
Melanie Griffin, MA, proxy for D. McKiernan (AA)	Emerson Hasbrouck, NY (GA)
Raymond Kane, MA (GA)	Joe Cimino, NJ (AA)
Sarah Ferrara, MA, proxy for Rep. Peake (LA)	Peter Clarke, NJ, proxy for T. Fote (GA)
Conor McManus, RI, proxy for J. McNamee (AA)	Allison Murphy, NMFS
David Borden, RI (GA)	John Coll, US FWS

(AA = Administrative Appointee; GA = Governor Appointee; LA = Legislative Appointee)

Ex-Officio Members

Renee Zobel, Technical Committee Chair	Jeff Kaelin, Advisory Panel Chair
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Staff

Robert Beal	Tina Berger	Jeff Kipp
Toni Kerns	Kristen Anstead	Dustin Colson Leaning
Lisa Carty	Emilie Franke	Sarah Murray
Pat Campfield	Lisa Havel	Joe Myers
Maya Drzewicki	Chris Jacobs	

Guests

Jordan Andrews, Press Herald	James Fletcher	Dan McKiernan, MA (AA)
Max Appelman, NOAA	Angela Forristall, NEFMC	Steve Meyers
Pat Augustine, Coram, NY	Pat Geer, VMRC	Jack Molmud, News Center ME
Megan Barrow, NYS DEC	Emily Gilbert, NOAA	Lindsey Nelson, NOAA
Alan Bianchi, NC DENR	Willy Goldsmith, SGA	Thomas Newman, NC
Colleen Bouffard, CT DEEP	Caroline Good, NOAA	Virginia Olsen, Local 207
Jeff Brust, NJ DEP	Kurt Gottschall, CT DEEP	Nick Popoff, US FWS
Joshua Carloni, NH FGD	Pam Lyons Gromen, WildOceans	Will Poston, SGA
Beth Casoni, MLA	Jon Hare, NOAA	Melissa Smith, ME DMR
Matt Cieri, ME DMR	Amalia Harrington, Univ ME	Renee St. Amand, CT DEEP
Heather Corbett, NJ DEP	Jay Hermsen, NOAA	Penelope Sutter
Nicole Lengyel Costa, RI DEM	Matthew Heyl, NJ DEP	Andrea Tomlinson
Jamie Cournane, NEFMC	Jaclyn Higgins, TRCP	Mary Beth Tooley, O'Hara Corp
Caitlin Craig, NYS DEC	Jesse Hornstein, NYS DEC	Chris Uранеck, ME DMR
Jon Deroba, NOAA	Nancy Koenig	Jesica Waller, ME DMR
Russell Dize, MD (GA)	Rob LaFrance, Quinnipiac Univ, CT	Craig Weedon, MD DNR
Maria Fenton, NOAA	John Maniscalco, NYS DEC	Kelly Whitmore, MA DMF
Marianne Ferguson, NOAA	J A McFarlan, RI DEM	Chris Wright, NOAA

These minutes are draft and subject to approval by the Atlantic Herring Management Board.
The Board will review the minutes during its next meeting.

The Atlantic Herring Management Board of the Atlantic States Marine Fisheries Commission convened in the Jefferson Ballroom of the Westin Crystal City Hotel, Arlington, Virginia, via hybrid meeting, in-person and webinar; Tuesday, August 2, 2022, and was called to order at 9:00 a.m. by Chair Megan Ware.

CALL TO ORDER

CHAIR MEGAN WARE: Good morning, everyone. I'm going to call the Atlantic Herring Management Board to order this morning. I would like to thank Cheri Patterson for her service as Chair over the last two years. My name is Megan; I am the incoming Chair for the Atlantic Herring Board.

APPROVAL OF AGENDA

CHAIR WARE: Our first order of business is Approval of the Agenda. I do want to note, we had a request to talk about industry funded monitoring for herring, so we're going to do that under-Agenda Item Number 6, just as an FYI for those who are interested in that. Are there any additions or modifications to the agenda this morning? Seeing none; the agenda is approved by consent.

APPROVAL OF PROCEEDINGS

CHAIR WARE: Next is approval of the proceedings, and these will be from October, 2021. Are there any edits to the proceedings? Seeing none; the proceedings are approved by consent.

PUBLIC COMMENT

CHAIR WARE: Next is public comment, and this is for items not on the agenda. We'll looked for raised hands in the room, and also on the webinar. Seeing no hands; we are going to assume that there is no public comment this morning.

REVIEW OF THE 2022 ATLANTIC HERRING MANAGEMENT TRACK ASSESSMENT AND PEER REVIEW REPORT

CHAIR WARE: We will move on to Agenda Item 4, which is Review of the 2022 Atlantic Herring Management Track Assessment and Peer Review Report. Dr. John Deroba from NOAA is going to present an overview of the 2022 Track Assessment for Atlantic Herring, so I will pass it off to him. Then afterwards, we will take questions and comments.

DR. JON DEROBA: Just a quick background, and then I'll get into the terms of reference. It was last assessed two years ago. It used the familiar statistical catch at age ASAP model that we often use in New England. There are like two fleets, a fixed-gear fleet, which is largely Canadian, and a mobile gear fleet, which is basically the U.S. fleet, which is trawlers and purse seines.

The assessment uses four surveys, Spring Bottom Trawl, Fall Bottom Trawl, a Summertime, also known as a Shrimp Bottom Trawl, and an Acoustic Time Series collected during the Fall Bottom Trawl Survey. Natural mortality is assumed constant at 0.35, and we haven't been able to estimate a stock recruit relationship, so MSY reference points using F40 percent proxy. The stock was overfished, but overfishing was not occurring back in 2020. I'm going to go over a few data changes, most of which didn't have much effect on the assessment. We get stop seine and some other fixed gear catch information from Canada. They made some changes to the way in which they handle their data.

Apparently, they used to do a lot of quality control in Excel Spreadsheets. They used to fill age length keyholes manually in Excel Spreadsheets. There was no standardization or reproducibility. Canada went through, standardized some computer code, to automate all of this and make it reproducible.

A bunch of data changes on the Canadian end, all I would say for the better. There are some minor changes to the fixed gear catches and the fixed gear catch at age, but that also had a negligible effect on

the assessment. Here is the catch time series, so the mobile fleet in black and the fixed fleet, which is largely Canadian, in purple.

I won't interpret that for you. I think you're probably all capable of seeing the same things I am. This is the age composition for the mobile fleet, which is the U.S. fishing fleet. Again, just trawls and purse seiners for the most part. You can see as you go from large bubbles that occur in the sort of upper left or left portion of the graphic, that you can track those cohorts as they go down to the right through time.

For the most part we haven't had any cohort tracking, or any sign of large cohorts for quite some time, maybe since about let's say 2011. This is the age composition for the fixed fleet, and you can see the estimated catch is almost exclusively Age 2 fish. This is term of reference 2, which was evaluating the indices used in the assessment.

The one minor change we made here was to use NMFS Spring and Fall Bottom Trawl Survey catches using tow specific measured distance. Though we used to assume that every tow had the same effective tow time, but that is not true. Since the use of the Bigelow, we can now get tow specific calculations, and account for the fact that each tow isn't fishing effectively for the same amount of time. Again, that had a negligible effect on the assessment.

There is the survey trend from the Spring Bottom Trawl Survey, not a trend you like to see. That is the age composition from that survey, so similar to the mobile fishery catches. You can track cohorts through time, and you can see, we haven't seen a good cohort incident event. Again, probably since about 2011.

This is the Fall Bottom Trawl Survey. Again, you see some very low observation in recent years, not something we want to see. There is the age composition for the Fall Bottom Trawl Survey, so a similar story to the other age comps that

we've already looked at. This is the Summer or Shrimp Bottom Trawl Survey, similar story in terms of recent low observations.

We did make a change to this dataset. Herring ages typically were not collected during the survey, so on the left what we used to do is take an average of the Spring and Fall Bottom Trawl Survey age length key, and use that to have age composition. We now have three years of age data collected directly from the survey, and that's what you see on the right. Rather than borrow age length key information, I'm using the age data collected from the survey directly, and if you advance the slide, on the left is the selectivity curve estimated from averaging age length key is from the spring and fall, on the right is the selectivity curve using the age data collected during the survey. Even though that selectivity shape is quite different, overall, this also had a negligible effect on the stock assessment.

This is the acoustic index that is collected during the fall bottom trawl survey, and again, some relatively low recent observations. If I were to run the model with just those minor data changes that I noted all had negligible effects on the assessment, that would have been sort of a very basic, the most simple sort of management track, simple update that I could have done.

Unfortunately, the model blew up. There is the reason why, 70 parameters with CVs greater than 0.5. A maximum CV on one of the parameters, whatever 7 to the plus 79 is. I was calling it nearly a google, 1,600 some parameter pairs of high correlation are a relatively large gradient. If this is all Greek to you, long story short, there is a bunch of diagnostics here that suggest this model is not useable.

The model is struggling to estimate something. I suspected we have no 2020 survey data, so I suspected the model was struggling to estimate recent recruitments, due to that missing survey data. I explored two solutions, the first was to derive a recruitment index from seabird diet data. There is the recruitment index, so this would be an

Age 1 herring index of abundance derived from seabird diet data. That is what is in the graphic there.

Adding this resolved all those diagnostic issues, but unfortunately the model did not fit this index very well. What you're seeing here are some diagnostics from an assessment run that tried to fit to this data. I'll call your attention to the upper right panel. First what you'll notice, those vertical bars are the error bars on the estimated observed Age 1 index.

The takeaway there is that this index is very uncertain and noisy. In the lower left is the time series of residuals. You see mostly negative residuals early on, and then a bunch of positive residuals in more recent years. All that to say that while including this index solved some of the problems, it's not fitting well, and so not useable, at least not yet.

A little bit more about that seabird index. I do think there is something useable in here. I suspect there is nonlinearities in the relationship between the index and Age 1 recruitment. I think they might be fixable. But we got this data in very late. I don't understand seabird feeding habits very well, but it would be a nice dataset to include in the future.

I'm looking to explore this more. I think we have a research track in 2025, so I hope to bring this up again. There is a list of folks that helped with that work that I wouldn't have considered it even, if it weren't for those folks. Back to this model that is still directing. The seabird diet index didn't work, so the second possible solution was to penalize recruitment deviations for deviating from median recruitment.

Historically the herring assessment estimates annual recruitments as free parameters, they can do whatever they want. You can add a penalty for that, which basically if you don't have information about a recruitment, you can just more or less make it close to the median. I

used a very weak penalty of coefficient of variation equal to 1. While this is new to herring, this type of penalty is very prominent in New England. It does help stabilize model estimates, especially in data sparse situations, as we have when we don't have 2020 survey data.

It did resolve all those diagnostic issues. Adding this penalty fixed those diagnostic issues. The hang up here is we now have, well let me describe the graphic first. The blue line is the model that blew up that does not have a recruitment penalty. You can see the most recent two recruitments are very, very low.

The red line, which you mostly cannot distinguish from the blue line, is what happens when I add the penalty. On the more recent years, 2020 and 2021, you see some higher recruitments. That is because there is no data in the assessment to inform those recruitments. All you are seeing there is a picture of false increase in recruitment that is driven entirely by the addition of this likelihood penalty on recruitment.

What you might interpret as maybe a positive trend in recruitment for the last two years, is really just a hard effect of this penalty I had to add to stabilize the model. Spawning stock biomass and F however, were indistinguishable between each of the model runs. Here is the retrospective tie in for this model fit.

That model fit with the recruitment penalty is what was put forward as the final model. This is the retrospective pattern for that model fit. The top row is fishing mortality, the bottom row is spawning stock biomass. The right-hand column is what we often look at when we're measuring retrospective severity, so the Mohn's Rho for F is negative 0.21. It's a bit obscured by the lines there, and the Mohn's Rho for SSB, you can see in the lower right, is 0.447.

This is the time series plot of total biomass, spawning stock biomass and exploitable biomass. This is the time series of fishing mortality rates. The

black line, F. report is the average F over Ages 7 and 8 for fully selected by the U.S. Mobile Fleet, and that is what we use for stock status and such. The black line is the one you want to pay attention to.

Here is that recruitment time series again. Again, you see a positive trend in the last two years. But again, that's driven almost entirely by the likelihood recruitment penalty I had to add, in order to stabilize the model. On to term of reference 4, which was Biological Reference Points. Just a review of what used to be done, and to some extent still is.

Like history traits like maturity, weights at age, just to use the recent 5-year average when we were calculating reference points. Selectivity equals F in the U.S. Fleet, and we use F 40 percent as a proxy for FMSY in long-term projections used to derive the SSB proxy. Recruitment was sampled from the full time series of estimated recruitments.

For the calculation of reference points, we used to just set the fixed gear fishing mortality to 0, so basically ignore the fixed gear mortality source when calculating biological reference points. Previous reviewers did not like that, so I changed it for this management track. When calculating the biological reference points, I now set the fixed-gear fishing mortality rate equal to its ten-year average, the most recent ten-year average, which equals 0.13. The top bullet is the reference points as they were in 2020. If I were to make no changes to the way in which reference points were calculated, other than to update the data. The middle bullet is what the reference points would have been, so an F40 percent of 0.5, and an SSB proxy that was slightly lower than in 2020.

When I add some accounting for the fixed gear fishing mortality rate, the F 40 percent is still 0.5, but you can see the SSB proxy comes down quite a bit, due to that new accounting for the fixed gear mortality rate. Looking at the bottom

set of bullets here now. We reconsidered the recruitment stanza to use the biological reference points.

We've had an unprecedented string of lousy recruitments in this stock, as you saw. Using a full time series of recruitments for reference points was just indefensible. We considered a couple alternatives. One was to just use the really poor recruitment since 2013, then we rejected that idea simply because it's too short of a time frame.

That is not even quite a full generation time for herring. The second thing we tried was to disentangle the effects of environment and spawning stock biomass on recruitment, and look for an environmental signal that might tell us that something in the environment changed, and we could use that to define a different recruitment signal.

What I did was conduct a change point analysis on the recruitment and recruit for spawner time series. I applied all the analyses to estimates from '65 to 2019, so I excluded those last years of recruitment estimates, because again, those estimates were driven almost exclusively by the recruitment likelihood penalty.

I limited the number of change points across that entire time series to 3, so that any block of time, and this will make sense hopefully on the next slide, would include at least two to three generations, to make sure we would have a relatively long or enough generations and enough years in each time series.

All that mumbo jumbo on the previous slide to say, I did an analysis to see if average recruitment or average recruit per spawner changed. On the left is the recruit time series, on the right is recruit per spawner. On the left you can see this change point analysis identified two different time stanzas, with significantly different average recruitment.

The problem is we don't know if the average recruitment is low because of low spawning stock

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biomass, or if something in the environment has changed, and we can expect lower production. If we standardize for spawning stock biomass size, which is what the right panel does, recruit per spawner. It's getting more at whether or not the environment changed.

You can see three-time stanzas that jump out, and since 1992 the average recruit per spawner has been much lower than it was from '77 to '91. All that to say, the panel on the right here is telling us that something about the environment since 1992 leads us to believe that the number of recruits we'll get for spawners is going to be lower than it used to be in the '70s to the early '90s. Instead of drawing recruitments from the full time series, we're only going to draw recruitments from 1992 to 2019. When we do that, I have now made two changes to how these reference points are calculated. I account for fixed gear fishing mortality, and I'm not only drawing recruitments from the stanza on 1992 to 2019. There you see the bottom bullets are the new reference points. These are the reference points that are now, I'll say official.

You can see the spawning stock biomass proxy is quite a bit lower than it otherwise would have been, because we're selecting recruitments only from a more recent time period. Here is the stock status plot, so the vertical axis is fishing mortality in 2021 over FMSY. That horizontal dash line at 1 would be F equal to FMSY.

Then the horizontal axis is spawning stock biomass in 2021 over the SSB_{msy} proxy. The overfished threshold is the vertical line at 0.5. You can see the stock is overfished, but overfishing is not occurring. That red line coming from the black dot is the retrospective adjusted value. A retrospective adjustment was necessary here, so that red dot is really what we're using for official stock status.

Short term projections, so previously fixed gear catches and short-term projections were equal in all years and equal to ten-year average. The mobile fleet fishing mortality rate, which is the U.S. Fleet, was specified based on the New England Council's Harvest Control Rule, and recruitments were drawn from the entire time series again.

Just as with the reference points, drawing from the entire time series was indefensible, so what I did was estimate an autoregressive model, meaning that since recruitment has been lousy recently, an autoregressive model will say that in the short-term recruitment is more likely to stay lousy. There are equations and details that I'm not going to get into.

Long story short, I estimated the parameters of this autoregressive model using the recruitments from 1992 to 2019. The process was initialized, meaning the short-term projections will start using the rho-adjusted 2021 recruitment estimate. That recruitment estimate, which is relatively low, and so again, all this AR model is doing is saying since recruitment is low in 2021, the projected recruitment in 2022 is also likely to remain low, and so on and so forth.

It will take some number of years until you reach sort of a longer term higher average recruitment. It will slowly creep back up to average, as opposed to immediately jumping to average recruitment. In this top table on the short-term projection results, if I were to have made absolutely no changes to the reference points or the short-term projection methodology.

If I had done things exactly like they were done in 2020, those were the projection results. If I used the reference points based on that change-point analysis, and we used this autoregressive recruitment in the short-term projections, that is what you're seeing in the bottom table. Term of reference 6 was report on previous research recommendations.

Back in 2020 it was suggested we account for fixed-gear mortality when doing biological reference

points. As I said, we did that. The SSC last go round suggested we consider autoregressive models for short-term projections. As I said, we did that. Here are some research projects that were listed as high priority in a 2018 stock assessment. Further research on the use of acoustics for the assessment. We've made no progress on that. I don't really see it ever happening, unless budget situations change drastically. I've been collaborating with our study fleet, to see if we can look at changes in herring's depth preference, so are they occupying the bottom more through time, and spending less time in sort of a pelagic zone?

That work is ongoing. You folks may have all heard about WHAM or state-space models. Probably in the 2025 research track we'll consider moving this assessment to a state-space model, probably WHAM. That is sort of a burgeoning technology that I think we're still learning about.

Previous assessments recommended we, to be blunt, do stuff to make sure we're doing it right. There are all sorts of local national and international projects looking at the performance of state-space models, including an ongoing research track at the Northeast Center. What did the Review Panel say?

In summary, the stock assessment was accepted. They made several recommendations. I've picked out a few key ones here. They made several suggestions, relatively simple ones for how data are handled, including continued otolith collections from that Summer/Spring survey. It wasn't clear why missing the 2020 survey data had such a large impact on the performance of the model, or the lack of performance in the model, I should say.

Exploring why that was, was recommended. I did that change point analysis on the recruitment and recruit per spawner, which might tell us that the environment has changed since 1992, but it doesn't tell us exactly what

has changed, so they recommended exploring some mechanistic relationships.

I got the impression the Review Panel was pretty happy with the way we went about defining the recruitment time stanza for reference points. But they recommended continued consideration of what we would call dynamic reference point, and continued work on that seabird Age 1 recruitment index. That is all I have.

CHAIR WARE: Great, thank you, Jon, I appreciate the presentation. It looks like there were some important changes to the recruitment assumptions here that feed into both the reference points and projections, so I think that is important for the Board to see. We'll start with questions. Any questions from the Board? If you're in-person you can just raise your hand or on the webinar raise your hand virtually. Yes, Justin Davis.

DR. JUSTIN DAVIS: I had a question regarding, it was the slide with the change point analysis with the stanzas on recruitment and recruit per spawner. I don't know if it is possible to bring that slide back up again.

MS. TONI KERNS: Jon, do you know which slide it is? It will help Maya to navigate the slides?

DR. DERObA: Yes, give me one moment. Slide 30.

MS. KERNS: Then one more thing, Jon. When you're not talking, it will help on our end to have you muted, just so there is no feedback in the room.

DR. DERObA: I'm happy to remain as quiet as possible.

MS. KERNS: Maya, if you're moving through the slides you are paused on questions.

DR. DAVIS: Great, thanks. My question is in the figure on the right, which is the stanzas of recruit per spawner, that estimate all the way on the right, the sort of spike there in that terminal year. I'm wondering, is that a product of that model artifact

high recruitment that came from using the likelihood penalty on recruitment? If so, I'm wondering, is that driving why those later years are included in the same stanza as 1992 up to, I guess it's about 2010 or so.

I was just curious. Looking at this it seemed like other than that estimate in that terminal year, it looks like in recent years it may have entered even another stanza of even lower recruit per spawner. I was just curious why the change point analysis maybe didn't identify those most recent years as a new stanza.

DR. DEROBA: That terminal point, I actually excluded the 2020 and 2021 estimates that were highly impacted by that recruitment penalty. That terminal point that you see is sort of above the red line that is relatively positive, has nothing to do with that likelihood penalty. It does tell us that at least since 1992, even though average recruit per spawner is lower, it is still possible to get at least slightly above average recruits per spawner, despite whatever change happened in '92.

I suspect the change point analysis didn't identify, let's say since 2010, didn't identify that as another stanza, because I limited the number of change points to three. Again, so that each stanza would have at least two to three generation times within it, as opposed to identifying if it allowed 15 or 20 change points. It would identify, because of differences in three-year blocks, which isn't very helpful.

CHAIR WARE: Any other questions for Jon? All right, I think that's it. Thank you, Jon, for the presentation, we appreciate it. I invite you to stick around for the rest of our meeting. We're going to be talking about portside sampling next, which obviously may have some impacts on the assessment. If you have time and can stick around that's great.

DR. DEROBA: I will plan to stick around. I have a sick wife who is watching our kid. She wasn't

able to get our kid to daycare this morning, because she felt so crappy. I will probably sign off at some point, but I will stay on for at least for another half hour or so.

CHAIR WARE: Thank you. Tell your wife we thank her for her service this morning. Just for the Board. The SSC is meeting this week to develop recommendations for the 2023, 2025 specifications. I think that is on Thursday, and then the Council will consider those at their September meeting. Those are our next steps. We're going to move on to – Toni.

MS. KERNS: If the Board had anything that they wanted the SSC to look at or a question for them, right now would be the time to tell us, and Emilie could pass that on to the SSC. While the Commission doesn't task the SSC to do anything, I think that they would be happy to have questions from us. If there is anything, we would just need to know that right now.

CHAIR WARE: If there are no hands, then we'll assume there are no comments for the SSC.

UPDATE ON THE PORTSIDE SAMPLING PROGRAM

CHAIR WARE: All right, great, so we'll move on to Agenda Item Number 5, which is an Update on the Portside Sampling Program. Just to kind of set the stage here, Maine DMR has been running a portside sampling program for much of the east coast. That funding has been through ACCSP, but that funding is expected to run out in 2023.

The Board needs to start considering what the response should be, as a result of that funding. We have Matt Cieri from Maine DMR, who is going to provide an overview of DMRs portside sampling program, and the status of the program funding. I'm hoping that this is an opportunity for everyone to get a brief refresher on what that program is. Then we can talk about next steps after the presentation. Matt, I will turn it over to you.

DR. MATT CIERI: Yes, I'm going to talk about the portside biological and bycatch sampling for Atlantic

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herring, where we've been and where we are, and where we might be headed. Maine DMR has been doing sampling for Atlantic herring since at least into the 1960s, back when the Boothbay facility in Maine was actually a federal lab, and sampling was done at the local canneries.

Sampling usually takes place portside for herring for biological sampling. Since about 2001, or about when I started DMR, we've been getting support through ACCSP to conduct a whole plethora of sampling regimes for Atlantic herring and other species. This project was expanded to mackerel and bycatch in 2004, and then expanded to menhaden in 2010, when they started to show up.

Since about 2016, most of the cost has been pretty much just supplies, use of a vehicle, et cetera. It has been fairly cheap, ranging between \$23,000.00 and \$26,000.00 a year. There are four main data products that we supply from this project. The first is the biological sampling of Atlantic herring.

It's based on BMS prelanding reports from federal harvesters. The range is between New Jersey and the Canadian border. The idea is to get 50 fish samples, which are generally frozen. Two samples per gear type, per statistical area, per biweekly period over the entire timeframe in which the fishery runs.

That usually works out to be about one sample for every 200 to 350 metric tons. The samples are brought back to the lab for later analysis, which I'll get into in a little bit. Then all the data are housed and analyzed at Maine DMR, and then are used as a primary input into Jon's assessment and the updates, but a little bit more on that later.

The second sort of sampling product that we provide is spawning sampling. Again, this uses the VMS prelanding reports to track vessels, make sure that they're fishing in the areas that

we want to have samples from. Generally, this is between August and November. We pretty much stay fairly close within the state of Maine for this, as most of the spawning area closures, as you guys know, are within the Gulf of Maine. But we sometimes do sampling in New Hampshire and Massachusetts.

Usually, our sampling year is 100 adult sized fish as a fresh sample for GSI calculation. We like to get two samples per spawning closure area a week when the fishery is up and running. These fresh samples are used for closing and then reopening ASMFC spawning management areas, typically in the Gulf of Maine.

The third data product is bycatch sampling, and that was added in a few years ago, as I alluded to earlier. This is conducted portside. Again, it's based on VMS prelanding reports, with a range between New Jersey and the Canadian border. Here what we're doing is we're systematically sub-sampling at timed intervals, off-loads that are happening, particularly to monitor for river herring and haddock bycatch quotas, and to determine overall bycatch composition.

This is done pretty much all year. Then we do a host of other sampling. In particular we do menhaden sampling, where we grab scales and take some data for Beaufort, and then ship the scales down to the Beaufort Lab for use in that assessment. We also do mackerel sampling, particularly in Area 2 in the winter time, where there is a mixture of herring and mackerel.

We've also done herring genetic sampling for different projects that have been doing genetic work for Atlantic herring. We've also picked up otolith samples for use in microchemical analysis, shape analysis. Then in the past we've also done some dogfish sampling, as we run across them for different projects.

That just sort of covers the actual grabbing the sample part of things. There is a whole other thing that happens once those samples get back into the

lab. All of this is funded by IJ back in the laboratory, and we get a host of biological information, including length and weight, sex, age determination. We have an age reader here at Maine DMR, who specializes in Atlantic herring.

We also do some calibrations for aging, between ourselves, NOAA, and DFO out of Canada. But we also look for spawning condition, as well as we've been doing some fecundity over the last probably six or seven years. This ends up being the primary data dependent data used in the assessment. If you'll remember back on Jon's slide, he was talking about year class strength from the fisheries.

That is where that data comes from, it comes from this portside sampling project. In addition to the assessment, it also supports a lot of Council and ASMFC management actions. For example, when managers want to know what the impact of a different closed area or some sort of management measure might have on the size and age of the fish caught. This is where that data comes from.

Over all, the DMR project with funding from ACCSP has provided really excellent results. It's fairly low cost and it covers the fishery, generally between New Jersey and the Canadian border, which is the bulk of the landings. A few years ago, we did a comparison between the portside bycatch sampling and at-sea observers, and they lined up fairly well, typically for small bodied fish, things like river herring and small haddock. The use of VMS pre-landings is actually kind of novel in this sort of approach, and we think it's actually it's really a good mechanism. For the most part we get a chance, using those VMS reports, to see where the boat is coming from, what fishing ground it's coming from.

In many cases the boat is unaware that there is going to be a sampler at the dock, sampling for

either bycatch or for biological sampling or for spawning sampling, until they tie up. In addition, we've supported a myriad of other projects as a platform to get things like genetic samples and otolith samples from a variety of different species.

As Megan suggested, this program will be ending in 2023. We have enough money to go through January 1, 2024, and we may have some additional money, depending on how we spend things between now and then. But that is sort of to be determined, and it's kind of up to the finance people about rolling over. But even if we do, it would only be for a certain number of months.

After that, my understanding is that DMR will continue to collect biological sampling and spawning samples from landings that occur in Maine, and of course we'll collect menhaden samples for the obligation to the FMP. But in general, we will be unable to conduct sampling out of state, or to conduct the portside bycatch sampling or to do mackerel sampling. Again, as that tends to be more in Area 2 in the winter.

Because the lab activities are actually covered under a separate grant, we will certainly process any samples that we get from other states or from other projects, in order to help fill in some of the gaps. It's the sample collection part, where the money is ending, whereas the laboratory part will still continue.

About 50 percent of the coastwide catch is landed in Maine, even in the most recent timeframe. This really will begin to limit our sampling for this fishery. It's likely that we're going to be under sampling Atlantic herring after this program ends, if there are no other actions that are taken.

In fact, that 50 percent that is landing in Maine, most of that comes from Area 1 and Area 1A. There will be particularly large holes in fishery dependent sampling for herring, particularly on Georges Bank and south of Cape Cod in Area 2. I think that's it. I would be happy to answer any questions you guys have.

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CHAIR WARE: Great, thank you, Matt. We'll start with questions, but as people raise their hand, maybe I'll turn it over to Jon Deroba quickly, if you want to provide any comments or sense of potential impacts to the assessment from reduced portside sampling, if you're still with us.

DR. DEROBA: I'm still with you. Everything that I'm about to say is complete speculation. But stock structure for Atlantic herring is an uncertainty in this assessment. We know there is discreet spawning on Georges Bank and in the Gulf of Maine. Any restricted sampling that becomes limited in space, would limit our ability to evaluate that impact in the future. Beyond that, if we have fewer age samples, the certainty with which we can estimate cohort size will decline pretty substantially. As you saw with missing 2020 survey data, it can put us on some shaky ground. That's it, I mean you can kind of infer the outcomes, but at this point I can't say anything definitively, it's all guess work.

CHAIR WARE: Thank you, Jon. We'll start with questions on how the portside sampling program works. Any questions for Matt? Yes, Bill Hyatt.

MR. WILLIAM HYATT: I want to make sure I'm remembering correctly what was presented. Is this really an issue over \$30,000.00, roughly in that neighborhood?

CHAIR WARE: Yes, I believe. Matt, go ahead, sorry.

DR. CIERI: It's usually below \$25,000.00. It was substantially more, earlier on before 2016, because we had somebody on payroll that was coming off of this grant. But Maine DMR decided that it was in its best interest to take up that person as part of our funding, and so we fund the person. The money that we're talking about is basically the use of a vehicle, field supplies, and overnight travel. That's it.

CHAIR WARE: Any other questions for Matt? Yes, Justin Davis.

DR. DAVIS: I guess to follow up on Bill's question. Matt, I would just be interested in your perspective. Has that level of funding in the past sort of been adequate to meet, it's tough to say, but to meet the objectives for the sampling program? I guess I was struck too by the low-price tag.

I just wonder, it allows an amount of sampling that is adequate to provide some data to address the questions relative to herring biological sampling, or river herring bycatch. Is there a sense that well more funding would be needed to provide the data that is really needed to meet those objectives? I guess I'm just looking for sort of an assessment of, is that level of funding adequate.

DR. CIERI: Actually, it probably is. We've been doing this work for, like I said at this sort of funding level since 2016. Even when the fishery was running a lot higher than it is now. In fact, we've been spending a little bit less money, of course as you can imagine. You know the herring fishery is already closed within 1A.

As the fishery, given the low spot it's in, it's more than adequate. Even if it ramps up quite a bit, \$25,000.00 is a lot of hotel rooms and meals, I guess is the best way of putting it. It seems to be adequate. We've been at that funding level, and have basically been covering the fishery fairly well.

CHAIR WARE: Thank you, Matt, and I'm hoping to hear the low-price tag, I hope means that this is something we can easily solve as a group. We'll talk about next steps after a few more questions. Conor McManus.

MR. CONOR McMANUS: Thanks for your presentation, Matt. Just thinking through the logistics, a bit, and perhaps this has already been explored. But is there possibly a way to enhance new or increased effort for collaboration with states, to help collect some of those samples? I'm thinking in southern New England with Area 2. Are

there tools that would allow for perhaps increased collaboration, as well as cost savings?

DR. CIERI: Yes, I mean certainly. During the pandemic the other states were really good, because we couldn't travel out of state very much, you know given our travel restrictions. I will say of course, when you're talking about funding a project, you're talking about you know for something like this, that becomes the priority. In some cases, for other states there are other priorities, rather than getting herring samples, depending on what's going on.

But there is certainly some, you know we certainly have collaborated really heavily with Mass DMF and Rhode Island as well, in getting ahold of samples and tracking down boats and those types of things. Yes, there is definitely ways that we can collaborate to sort of bring down the cost. I just think once that funding ends, I can't justify sending a Maine state employee out of state to sample in another state.

CHAIR WARE: Conor, are you all set?

MR. McMANUS: Yes, thank you for that and I guess I'll hold the other comment until we discuss next steps, thanks.

CHAIR WARE: All right, any other questions for Matt? All right, I do see we have a few members of the public with their hand raised. Since we're a little ahead of schedule. Oh, Ray Kane, go ahead, Ray.

MR. RAYMOND W. KANE: Matt, this past year I understand Area 3, they filled that pack in no time whatsoever, and I don't really know how much herring fishing went on in Area 2. When you speak about the low cost of this program, which I agree, and I think we should find funding to continue it.

What happens with the excess money, like from this year like that they've shut down, I believe

today in 1A. I think it was very limited in 2, so is there any surplus money from this year's budget that we could move forward?

DR. CIERI: That's what I was talking about, as far as maybe being able to extend it a few months afterwards. You do also have to understand that the ability to rollover money, because these are managed as federal grants, is severely limited. Lots of times any money that we haven't used, particularly during the pandemic, you know we were able to roll over some and extend it. But in many cases, it just simply goes away for us.

MR. KANE: Thank you for the explanation. I presume this whole presentation, I believe it's been funded what, for the past ten years ASMFC has funded this program, or longer?

DR. CIERI: ACCSP has funded this since 2001, so over 20 years.

MR. KANE: This presentation bottom line is we're going to look for a motion to continue funding this very important research project. Correct?

CHAIR WARE: Ray, this is Megan. I think we're going to talk about next steps in just a few moments, so maybe I'll have you hold that question and comment, and we'll get back to that.

MR. KANE: Thank you, Megan. Thank you, Matt.

CHAIR WARE: As I mentioned, we have a few members of the public with their hands raised. At this point I'm just going to take questions, so Pam, did you have a question you wanted to ask?

MS. PAM LYONS GROMEN: I did have a question, thank you, Madam Chair. Thank you, Matt, for the presentation. My question is about your bycatch sampling. I was wondering if any of the samples for river herring and shad go to the Alosine Genetic Repository Study that is a partnership between the Commission and USGS, if that has been a part of that effort?

DR. CIERI: We have grabbed genetic sampling in the past. I'm not quite sure what the status of that is currently, but we have been. One of the projects has provided genetic samples to that project.

MS. LYONS GROMEN: Thank you, I do think that is another important aspect of the work that you do.

CHAIR WARE: All right, thank you, Pam. Let's move into a discussion of next steps, and at least from my perspective, I think there are kind of two outcomes here that we could try and pursue. As people have alluded to, it's not a huge chunk of change we're talking about. One option is to try and find funds that will cover that money, and keep the same format where DMR is collecting and analyzing the samples.

I think the other option is to consider something like a menhaden-esque approach, where each state is collecting the samples and then sending them to DMR for analysis. Again, that analysis is on a separate grant. Those are kind of the two ways that I see the Board to try and address this. But I'm happy to at least have an initial conversation. We have some time.

But I don't expect any decisions today. I think maybe the best path forward is, as a Chair request that Emilie help us coordinate some discussions with the states over the next few months, to kind of assess what the best path forward is, and assess what some of the funding opportunities may be. Ray, to your question previously. I don't think we need a motion today, but if anyone has any reactions to those two paths, we can take those comments. Melanie Griffin.

MS. MELANIE GRIFFIN: Yes, as you just kind of distinguished, that is what I was gathering from this presentation, that there are some aspects of this portside sampling program that can continue to be funded without problems, thinking that a lot of analytical work that Matt

presented. But the real budget shortfall is that collection of herring and mackerel biological and spawning samples from non-Maine landings. I know in the past Massachusetts has been supportive collecting its own samples in-state. I definitely could see that as one path forward, where we would carve off those sampling costs and processes by state, that more collaborative process that folks were talking about. Certainly, that could be a more efficient administration, given conceivably it would reduce some of these costs, those travel costs. But there are plenty of details that would need to be ironed out.

One particular one I know that we've struggled with in the past is including some kind of VIMS access to refine port sampling. I think those are real important conversations if we want to pursue this path. I like that idea of having some follow up meetings amongst the state agencies to really roll up our shirt sleeves and see what that might look like, if that kind of path forward is what we want to do. I guess that's just to say I'm supportive of having that conversation. Thanks.

CHAIR WARE: Thank you, Melanie. Ray Kane.

MR. KANE: Yes, I support what Melanie just stated. We have to keep in mind that the range of states would run from Maine to Jersey. If I'm not mistaken, fish are landed in Jersey out of Area 2 in the wintertime. Also, would the vessels that land 6,000 pounds or less be included in this research?

CHAIR WARE: Any other comments on the suggested path forward. I think we have two options here, and then a subsequent meeting with the states. Eric.

MR. ERIC REID: Okay, the states are going to talk about how they can fund it. I would like to know from the Service what they can do for funding, once it runs out. Is there anybody at the Service that is working on this project, or is it going to fall all on the states? Thank you.

CHAIR WARE: I don't know if anyone from NOAA wants to answer that. Otherwise, we'll get you an answer later. Alli, go ahead.

MS. ALLISON MURPHY: I'm certainly not, I don't have a lot of association or much information on the budgetary side of things here. As we'll likely to discuss under a subsequent agenda item, we have our own funding issues with continuing funding the industry funded monitoring program. I'm not sure that it's realistic to assume that if we can't fund industry monitoring, that we would be able to take on this program. But I'm happy to take this topic back to folks in my office, and chat with folks.

CHAIR WARE: Thank you, Alli. Any other questions or comments? Bob.

EXECUTIVE DIRECTOR ROBERT E. BEAL: Just a comment. I think the state conversation about state conduct that sampling as a good long-term solution. There may be some money within a cooperative agreement that we have at ASMFC with NOAA Fisheries, it's kind of leftover what we call Plus Up money from about four years ago.

It's not a long-term funding source, but it may be kind of a Band-Aid to get us through this conversation period and over the hump. No guarantees. I'll look at that and see if it's an option, and work with Maine and work with Emilie as she works through that conversation with the state sampling. There may be some short-term money. It's \$30,000, not a whole lot of money. We should be able to scrape that up for a few years if we're transitioning to state conduct, or whatever this looks at, whatever the long-term solution is. We'll bring something back at the next meeting, and report out on what is available.

CHAIR WARE: Okay, great. Final call from any comments. Justin.

DR. DAVIS: Just to clarify. There will be some follow up after this meeting, sort of e-mails or something to get the states talking about how to approach this.

CHAIR WARE: Yes, I'm going to ask Emilie probably early this fall to try and schedule a webinar meeting with the state agencies, so we can discuss how we want to move forward. It sounds like there may be some interim funding that could tie us over for a little bit, so that is good to hear. Then we can report back at future board meetings about how those discussions are going.

UPDATE FROM THE NEW ENGLAND FISHERY MANAGEMENT COUNCIL

CHAIR WARE: Seeing no other hands, we're going to move on to Agenda Item 6, which is an Update from the New England Fishery Management Council.

We have Dr. Jamie Cournane here, who will provide an overview of the Council herring priorities, and the discussion from the June, 2022 Council meeting. Really the purpose here is to help improve communication between the Commission and Council on herring management. At the end we'll hopefully have some time for questions. Jamie, I will pass it over to you.

DR. JAMIE COURNANE: Good morning, everyone. I have been in this role for about a month now, covering the Herring Plan. Prior to that Dr. Rachel Feeney was serving as the interim Plan Coordinator. I will be serving in this role at least through the September Council meeting, and I will do my best to answer your questions about what I have to present today, and the Council's work on herring.

One of the big tasks that the Council undertook was developing a rebuilding plan for Atlantic herring, after finding out that the stock was overfished. That rebuilding plan has now been approved. It's in Framework Adjustment 9, and the effective date of that plan is August 18 of this year. You'll find that

Final Rule published in the Federal Register mid-July.

What this rebuilding plan does is it takes the Council's Control Rule and continues to use that as a way to set an F rebuild. Based on the rebuilding plan that was developed at the time the projections indicated rebuilding within five years, and that would be by fishing year 2026. It assumed long-term average recruitment in those projections.

If you're not familiar with the Council's Control Rule for Herring, it is biomass based, and when biomass is greater than the ratio of spawning stock biomass to spawning stock biomass at MSY, then that is greater than 0.5. The maximum fishing mortality allowed is 80 percent of FMSY. But as biomass declines so is fishing mortality in linear fashion.

If biomass falls below 0.1 for that same ratio, then the ABC is set to 0, and there is no fishery allocation. A second part of Framework Adjustment 9 is that it adjusts how accountability measure catch trigger threshold work. In the event there is an overage in a sub-ACL in one fishing year, it's only deducted in the subsequent fishing year. This would be Year 3 in this case. If an overage exceeds 10 percent of that sub-ACL, and/or if the ACL is also exceeded in the same year so that changes how those thresholds are determined. For several years now the Council has been working on Framework Adjustment 7.

There is a longer history, I won't review, but I wanted to provide you an update on where the Council is with this work. Back in May there was a joint meeting of the Plan Development Team and Advisory Panel, and at this meeting they were discussing the development of alternatives for Framework Adjustment 7, which could include alternatives to protect spawning adult herring.

There was a lot of information that was still lacking, and the PDT felt that this could be difficult to monitor and enforce. At the same time, the Advisors felt that they do support this incentive to avoid spawning herring. The Committee discussed some of this as well at their June meeting. They didn't pass any specific motions.

They did table a motion to stop action on Framework 7. This was not brought up at the Council, because we would have to be noticing on our agenda, we would be considering such a motion. But at the time the Committee did feel that postponing work over the summer would make sense, and asked the Council, does this make sense for postponing the work on this action until September?

We will be discussing this again on the plans for this Framework at our September or future meeting. But right now, everything is on hold for developing any kind of spawning protections on Georges Bank through this Framework adjustment. The core thing that we've been working on for Atlantic herring this summer is setting specifications for the next three years.

You heard Dr. Jon Deroba provide a presentation on the results of the stock assessment. Then on Thursday our Scientific and Statistical Committee will convene to discuss recommending overfishing limits and acceptable biological catches for the stock for the next three years. That meeting has been preceded again by the Peer Review, and then two meetings of our Plan Development Team to develop recommendations.

All of those reports and information are now available on our website. If you want to know where that is, I'll share that with Emilie and she can share all the details of that meeting. If you plan to join that meeting, it is available by webinar. We're expecting this action to set overfishing limits, ABCs using the Control Rule and the Rebuilding Plan.

Then there is a number of pieces, elements of the

These minutes are draft and subject to approval by the Atlantic Herring Management Board.
The Board will review the minutes during its next meeting.

flow chart, if you will, that go into this specification setting process, including management uncertainty, annual catch limits, the management area based sub-ACLs and river herring and shad catch caps. There are also some other components that get set through specifications. We anticipate that our Advisory Panel and Committee will meet on September 23, to make recommendations on their preferred alternatives. That will also be in a meeting by webinar. It's on a Friday. AP will be in the morning and the Committee will be in the afternoon. The following week the Council will take final action on specifications at an in-person meeting in Gloucester, Massachusetts, which is also available to the public by webinar official station. Lastly, I was asked to provide a brief update on industry funded monitoring.

I think that NOAA staff will provide greater details. But what we heard back earlier this year is the concerns about not having the funding identified for the program, specifically to administrate and in May our Advisory Panel met and they discussed potentially initiating an action to advise the weighting approach in the industry funded monitoring program, to address the shortfall for the herring fishery.

In June, the Committee didn't make a specific motion, and our Council didn't take any action in June. We did discuss the issue. Presently the program will be on hold past April 2023, without federal funds. There is a provision of the program that there is a required program review that would begin in 2023.

I think the Service can provide greater details on the status of the industry funded monitoring program. At this point the Council did not decide to take any specific action at its June meeting. That concludes my presentation and brief update, and thank you for the opportunity to preset it today. Hope I can answer any questions you may have.

CHAIR WARE: Thank you, Jamie. We'll start with any questions from the Board for Jamie. Justin.

DR. DAVIS: Thanks for this update. I'm curious. I will admit, I don't understand this as well as I would like to. The bycatch caps that are in place for river herring in some fisheries. It was my understanding that the at-sea monitoring is one of the data sources that are used to assess how the fishery is performing relative to those bycatch caps.

I'm curious whether the portside sampling that we discussed earlier today also plays into that, and then I'm just sort of wondering, if we get into a situation here where the at-sea monitoring is on hold indefinitely, what information will be used to assess how those fisheries perform against those river herring bycatch caps?

CHAIR WARE: Jamie, do you want to take a crack at that? If not, I can try and provide an answer.

DR. COURNAME: I don't want to guess at the answer to this question. I will admit that it's been some time since I've looked at the data that goes into determining the values for river herring catch caps. But I hope that someone else can answer the question, or if you give me a moment, I can find out for you.

DR. CIERI: I can answer this if you want me to. Yes, the portside sampling, you know the ACCSP funded portside sampling, does feed directly into the river herring and haddock bycatch caps. We forward that data on to NOAA as we get it.

CHAIR WARE: I think that's a partial answer, maybe Justin, and we can follow up. I think I'll just highlight it's just industry for the monitoring that is on pause in 2023, not NEFOP. I'm unclear though if NEFOP collects anything related to bycatch. Alli may have some additional information.

MS. MURPHY: I believe it's a combination of the SBRM or NEFOP coverage as well as information from the portside sampling program.

CHAIR WARE: Okay, thank you, Alli. Any other questions for Jamie? Jamie, it looks like you have your hand up.

DR. COURNANE: Yes, thank you. I can send a link to staff, but if you go to GARFOs reporting page for the river herring and shad quota in-season monitoring, there is a summary of the data and the approaches that are used to determine the estimates in season. That is what I was looking for when you were asking the question. I would be happy to share that if folks are interested in greater detail.

CHAIR WARE: Great, thank you, Jamie. All right, last call for any questions or comments. All right, seeing none; thank you, Jamie, we appreciate your time.

ADJOURNMENT

CHAIR WARE: We'll move on to our final agenda item, which is Other Business. I didn't have any other business brought forward. Seeing no hands raised, I think we can go ahead and adjourn the meeting, so I'll ask for a motion to adjourn. Steve Train, and a second from Cheri. Thank you.

(Whereupon the meeting adjourned at 10:15
a.m. on Tuesday, August 2, 2022)



New England Fishery Management Council

FOR IMMEDIATE RELEASE
September 30, 2022

PRESS CONTACT: Janice Plante
(607) 592-4817, jplante@nefmc.org

Atlantic Herring: Council Signs Off on 2023-2025 Specifications; Receives Stock Assessment Overview

The New England Fishery Management Council voted on a 2023-2025 specifications package that will determine catch limits for the Atlantic herring fishery for the next three fishing years.

The Council took this step during its [September 2022 hybrid meeting](#) in Gloucester and based the decision on:

- The most recent [stock assessment information](#) available;
- The Scientific and Statistical Committee’s overfishing limit (OFL) and acceptable biological catch (ABC) [recommendations](#) for the resource; and
- The herring rebuilding plan in [Framework Adjustment 9](#).

The 2023-2025 annual catch limits (ACLs) are low but represent an increase from recent fishing years. For comparison, here is what the 2022 area-by-area sub-ACLs were:

Atlantic Herring Management Areas	Initial 2022 Sub-ACLs
Area 1A	1,184
Area 1B	176
Area 2	1,139
Area 3	1,598
Total ACL	4,098

The sub-ACLs above are in metric tons (mt).

2023-2025 Atlantic Herring Specifications (in Metric Tons)

Specification	2023	2024	2025
Overfishing Limit (OFL)	29,138	32,233	40,727
Acceptable Biological Catch (ABC)	16,649	23,409	28,181
Management Uncertainty*	4,220	4,220	4,220
Optimum Yield / Annual Catch Limit (OY/ACL)	12,429	19,189	23,961
Domestic Annual Harvest	12,429	19,189	23,961
Border Transfer	0	0	0
Domestic Annual Processing	12,429	19,189	23,961
U.S. At-Sea Processing	0	0	0
Area 1A Sub-ACL (28.9%)*	3,592	5,546	6,925
Area 1B Sub-ACL (4.3%)	534	825	1,030
Area 2 Sub-ACL (27.8%)	3,455	5,335	6,661
Area 3 Sub-ACL (39%)	4,847	7,484	9,345
Fixed Gear Set-Aside	30	30	30
Research Set-Aside as % of Sub-ACLs	0%	0%	0%

* If the New Brunswick weir fishery landings through October 1 are less than the associated “trigger” of 2,722 mt, then 1,000 mt will be subtracted from the management uncertainty buffer and added to the Area 1A sub-ACL and the ACL.



New England Fishery Management Council

The specifications must be approved and implemented by NOAA Fisheries before going into place. The new herring fishing year will begin on January 1, 2023.

STOCK ASSESMENT: Before considering the specifications package, the Council received a [presentation](#) from the Northeast Fisheries Science Center on the [peer reviewed results](#) from the [June 2022](#) Atlantic Herring Management Track Stock Assessment.

The assessment results indicate:

- Atlantic herring is overfished but overfishing is not occurring.

- Survey data from 2020 was missing because surveys did not occur due to public health restrictions during the COVID-19 pandemic. This issue represents a source of uncertainty in the assessment.

- Spawning stock biomass in 2021 was estimated to be at 21% of the biomass target.

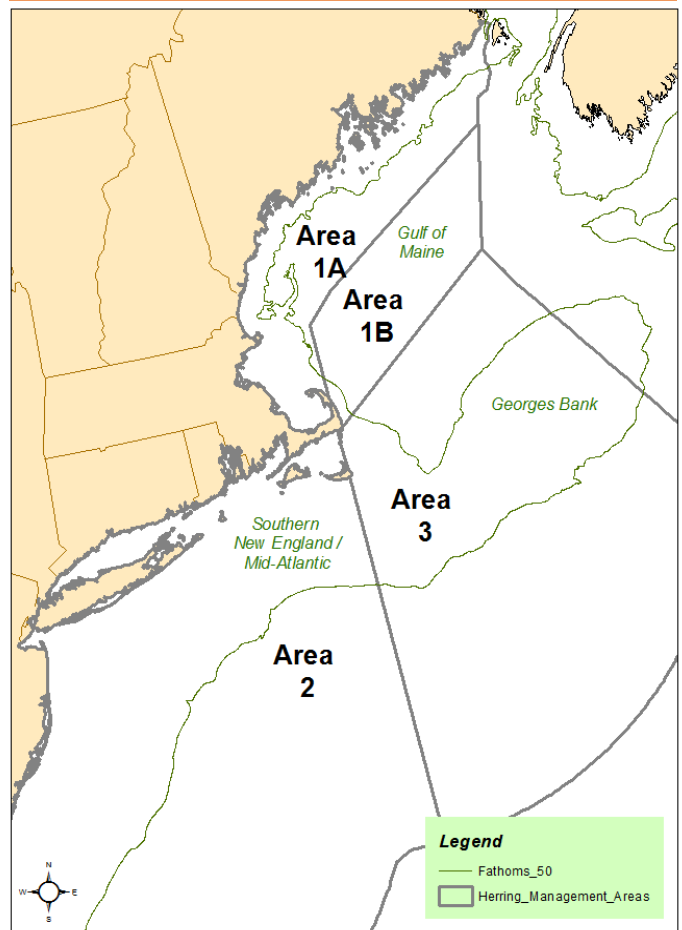
- Fishing mortality in 2021 was very low, estimated at 31% of the overfishing threshold proxy.

- Despite low fishing pressure, recruitment continues to be poor, which is another source of uncertainty. And, among other results,

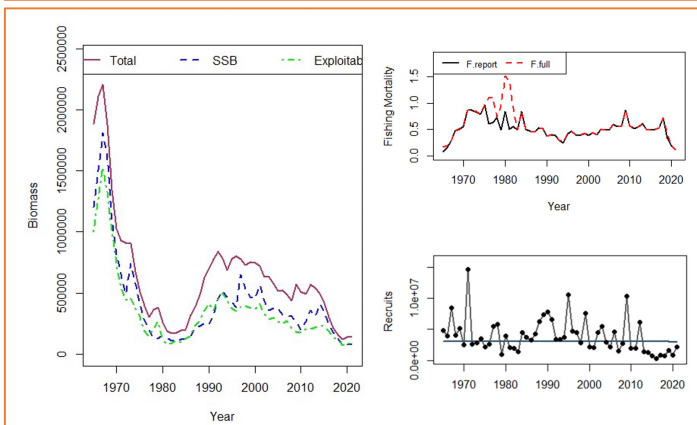
- The assessment used an updated method to develop projections about future recruitment, which the stock assessment peer reviewers, Scientific and Statistical Committee (SSC), and the Herring Plan Development Team (PDT) consider to be more realistic.



Atlantic Herring Management Areas



2022 Atlantic Herring Assessment Results: Biomass, Fishing Mortality, and Recruitment Trends from 1965 through 2021





New England Fishery Management Council

The SSC considered the assessment results and based its overfishing limit (OFL) and acceptable biological catch (ABC) recommendations on the Council’s ABC control rule for herring, which was developed in [Amendment 8](#) to the Atlantic Herring Fishery Management Plan (FMP). The control rule is biomass-based, so when biomass declines, the allowable level of fishing mortality on the resource also declines. The maximum fishing mortality allowed on the herring resource under the ABC control rule is 80% in order to account for herring’s role in the ecosystem as a forage species. If biomass declines below a specified low level, fishing mortality is reduced to zero.

The specifications also factor in the Council’s rebuilding plan for herring, which was adopted through [Framework Adjustment 9](#) to the Atlantic Herring FMP and [implemented on August 18, 2022](#). Under the framework’s rebuilding projections, the herring resource is expected to rebuild in five years – by fishing year 2026 – assuming long-term average recruitment in the fishery, although updated projections indicate rebuilding may take an additional two years.

The 2023-2025 specifications package will be submitted to the Greater Atlantic Regional Fisheries Office (GARFO) for review, approval, and implementation. The package maintains the river herring and shad catch caps that are currently in place for specific gear types as shown in the table below.

FRAMEWORK ADJUSTMENT 7: The Council also discussed [Framework Adjustment 7](#) to the herring plan, which has been under development since 2019. The action proposes measures to protect spawning adult herring on Georges Bank.

The Council considered changing its 2022 herring priorities to discontinue work on the action for several reasons, including: (1) fishing activity for herring on Georges Bank has dropped considerably under the current low catch limits; (2) monitoring and enforcement of offshore spawning areas will be difficult; (3) the Council’s herring staff will be focused on completing and submitting the herring specifications package over the next few months; and (4) much more work needs to be conducted to fully develop the details of Framework 7.

However, many Council members preferred to continue developing the framework, recognizing that focused work on this action will resume in early 2023. Therefore, the Council will proceed with developing the details of this action.

QUESTIONS? Contact Dr. Jamie Courname at jcourname@nefmc.org.

River Herring and Shad Catch Caps Fishing Years 2023-2025 (in metric tons)

Gear and Area	2023	2024	2025
Midwater Trawl Gulf of Maine	76.7	76.7	76.7
Midwater Trawl Cape Cod	32.4	32.4	32.4
Midwater Trawl Southern New England and Mid-Atlantic	129.6	129.6	129.6
Bottom Trawl Southern New England and Mid-Atlantic	122.3	122.3	122.3



Atlantic herring. – Meghan Lapp photo

Atlantic States Marine Fisheries Commission

American Lobster Management Board

November 7, 2022

9:45 – 11:45 p.m.

Hybrid Meeting

Draft Agenda

The times listed are approximate; the order in which these items will be taken is subject to change; other items may be added as necessary.

1. Welcome/Call to Order (*J. McNamee*) 9:45 a.m.
2. Board Consent 9:45 a.m.
 - Approval of Agenda
 - Approval of Proceedings from August 2022
3. Public Comment 9:50 a.m.
4. Update on North Atlantic Right Whale Court Cases 10:00 a.m.
5. Review Annual Data Update of American Lobster Indices (*K. Reardon*) 10:15 a.m.
6. Consider Next Steps on Draft Addendum XXVII on Increasing Protection of Spawning Stock Biomass of the Gulf of Maine/ Georges Bank Stock (*C. Starks*) **Possible Action** 10:30 a.m.
7. Update from Work Group on Implementation of Addendum XXIX on Electronic Vessel Tracking for Federal Permit Holders (*C. Starks*) 11:00 a.m.
8. Discuss the Trap Transfer Tax for the American Lobster Fishery (*D. McKiernan*) 11:10 a.m.
9. Progress Update on Jonah Crab Benchmark Stock Assessment (*J. Kipp*) 11:25 a.m.
10. Consider Fishery Management Plan Reviews and State Compliance for American Lobster and Jonah Crab for 2021 Fishing Year (*C. Starks*) **Action** 11:30 a.m.
11. Other Business/Adjourn 11:45 a.m.

The meeting will be held at The Ocean Place Resort (1 Ocean Boulevard, Long Branch, NJ 07740; 732.571.4000) and via webinar; click [here](#) for details

MEETING OVERVIEW

American Lobster Management Board

November 7, 2022

9:45 – 11:45 a.m.

Chair: Dr. Jason McNamee (RI) Assumed Chairmanship: 02/22	Technical Committee Chair: Kathleen Reardon (ME)	Law Enforcement Committee Representative: Rob Beal
Vice Chair: Pat Keliher (ME)	Advisory Panel Chair: Grant Moore (MA)	Previous Board Meeting: August 2, 2022
Voting Members: ME, NH, MA, RI, CT, NY, NJ, DE, MD, VA, NMFS, NEFMC (12 votes)		

2. Board Consent

- Approval of Agenda
- Approval of Proceedings from August 2, 2022

3. Public Comment – At the beginning of the meeting public comment will be taken on items not on the agenda. Individuals that wish to speak at this time must sign-in at the beginning of the meeting. For agenda items that have already gone out for public hearing and/or have had a public comment period that has closed, the Board Chair may determine that additional public comment will not provide additional information. In this circumstance the Chair will not allow additional public comment on an issue. For agenda items that the public has not had a chance to provide input, the Board Chair may allow limited opportunity for comment. The Board Chair has the discretion to limit the number of speakers and/or the length of each comment.

4. Update on North Atlantic Right Whale Court Cases (10:00-10:15 a.m.)

Background

- U.S. District Court Judge James E. Boasberg’s ruling in Center for Biological Diversity versus Secretary Raimondo and the Maine Lobstermen’s Association was released in the [July 8, 2022 opinion](#).
- The ruling concluded that aspects of the 2021 Biological Opinion and the 2021 final rule violated federal law: NOAA Fisheries violated the Endangered Species Act by failing to satisfy the Marine Mammal Protection Act’s (MMPA) “negligible impact” requirement before setting the authorized level of lethal take in its incidental take statement, and that NOAA Fisheries breached the time requirements mandated by the MMPA in the 2021 final rule.
- Additional briefing hearings to determine the action(s) the agency must take moving forward have been held in recent months.

Presentations

- Update on North Atlantic Right Whale Court Cases

5. Review Annual Data Update of American Lobster Indices (10:15-10:30 a.m.)

Background

- An annual Data Update process between American lobster stock assessments was recommended during the 2020 stock assessment to more closely monitor changes in stock abundance. The objective of this process is to present information—including any potentially concerning trends—that could support additional research or consideration of changes to management. Data sets updated during this process are generally those that indicate exploitable lobster stock abundance conditions expected in subsequent years and include: young-of-year settlement indicators, trawl survey indicators, and ventless trap survey sex-specific abundance indices.
- This is the second Data Update and provides an update of last year’s review with the addition of 2021 data. Indicator status (negative, neutral, or positive) was determined relative to the percentiles of the stock assessment time series (i.e., data set start year through 2018) (**Briefing Materials**).

Presentations

- Annual Data Update of American Lobster Indices by K. Reardon

6. Consider Next Steps on Draft Addendum XXVII on Increasing Protection of Spawning Stock Biomass of the Gulf of Maine/Georges Bank Stock (10:30-11:00 a.m.) Possible Action

Background

- Draft Addendum XXVII was initially initiated in 2017 to proactively increase protection of the GOM/GBK stock but stalled due to the prioritization of Atlantic right whale issues. After accepting the 2020 Benchmark Stock Assessment for American lobster, the Board reinitiated work on the draft addendum in February 2021, with a focus on developing a trigger mechanism that would automatically implement management measures to improve protection of the GOM/GBK spawning stock if the trigger is reached.
- The Board approved Draft Addendum XXVII for public comment in January 2022. The Addendum considers modifications to the management program with the goal of increasing protection of the GOM/GBK spawning stock. Two issues are included in the addendum. Issue 1 addresses the standardization of a subset of management measures within LCMA’s and across the GOM/GBK stock. Issue 2 considers applying either a trigger mechanism or a predetermined schedule for implementing biological management measures that are expected to provide increased protection to the spawning stock biomass and increase the resiliency of the stock (**Briefing Materials**).
- The Board paused development of the Draft Addendum to allow time to better understand other challenges facing the fishery. At its August 2022 meeting the Board discussed concerns regarding the potential implications of the management proposed measures in the Draft Addendum for international trade. The Board tasked the PDT to discuss this issue and suggest possible paths forward and potential impacts.

Presentations

- Next Steps on Draft Addendum XXVII for Public Comment by C. Starks

Board Actions for Consideration at the Meeting

- Determine next steps for development of Draft Addendum XXVII

7. Update from Work Group on Implementation of Addendum XXIX on Electronic Vessel Tracking for Federal Permit Holders (11:00-11:10 a.m.)

Background

- In March 2022, the Board approved Addendum XXIX to Amendment 3 to the Interstate Fishery Management Plan (FMP) for American Lobster and Addendum IV to the Jonah Crab FMP. The Addenda establish electronic tracking requirements for federally-permitted vessels in the American lobster and Jonah crab fisheries. The addenda address several challenges facing the fishery, including stock assessment limitations, protected species interactions, marine spatial planning efforts, and enforcement in federal waters.
- The Addenda require federally-permitted American lobster and Jonah crab vessels with commercial trap gear area permits for Lobster Conservation Management Areas (LCMAs) 1, 2, 3, 4, 5, and Outer Cape Cod to collect location data via an approved electronic tracking device.
- Since approval of the Addenda, Commission staff formed a Work Group comprised of state and federal partners to develop a request for quotes from vessel tracking device manufacturers. The request for quotes was released in the fall of 2020, and the Work Group is in the process of evaluating the quotes submitted.

Presentations

- Update on Implementation of Addendum XXIX by C. Starks

8. Discuss the Trap Transfer Tax for the American Lobster Fishery (11:10-11:25 a.m.)

Background

- In the early 2000s several Addenda were implemented to establish a 10% conservation tax for trap transfers in the LCMAs within the Southern New England (SNE) as part of a broader effort to reduce exploitation of the SNE lobster stock.
- After significant effort reductions in the SNE fishery, the conservation tax on the trap transfer program only removes a small amount of traps from the system as transactions are very limited.
- Some Board members are concerned that the conservation tax is now resulting in unintended consequences by altering reporting behavior due to a reluctance to transfer trap allocations, and therefore lose traps because of conservation tax.

Presentations

- Review of Trap Transfer Tax in the Lobster Fishery by D. McKiernan

9. Progress Update on Jonah Crab Benchmark Stock Assessment (11:25-11:30 p.m.)

Background

- Work on the first Jonah crab benchmark stock assessment was initiated in early 2022.
- A Data Workshop was held virtually June 13-15, 2022, and a Methods Workshop was held virtually October 3-5, 2022.
- The assessment is scheduled for completion in the fall of 2023.

Presentations

- Progress Update on Jonah Crab Benchmark Stock Assessment by J. Kipp.

10. Consider Fishery Management Plan Reviews and State Compliance for American Lobster and Jonah Crab for 2021 Fishing Year (11:30-11:45 a.m.)

Background

- State compliance reports for American lobster and Jonah crab were due August 1, 2022.
- The Plan Review Teams reviewed state compliance reports and compiled the annual FMP Reviews for lobster and Jonah crab for the 2021 Fishing Year (Briefing Materials; Supplemental Materials) (**Briefing Materials**).
- Delaware, Maryland, and Virginia have requested and meet the requirements for *de minimis* in the lobster and Jonah crab fisheries.

Presentations

- FMP Reviews for American Lobster and Jonah Crab for the for the 2021 Fishing Year by C. Starks

Board Actions for Consideration at the Meeting

- Approve FMP Reviews, state compliance reports, and *de minimis* requests

11. Other Business/Adjourn

American Lobster and Jonah Crab TC Task List

Activity level: High

Committee Overlap Score: Medium

Committee Task List

Lobster TC

- Fall 2022: Annual data update of lobster abundance indices

Jonah Crab TC

- Fall 2022: Development of methods for Jonah crab stock assessment

TC Members

American Lobster: Kathleen Reardon (ME, TC Chair), Joshua Carloni (NH), Jeff Kipp (ASMFC), Catherine Fede (NY), Conor McManus (RI), Chad Power (NJ), Tracy Pugh (MA), Burton Shank (NOAA), Craig Weedon (MD), Somers Smott (VA), Renee St. Amand (CT)

Jonah Crab: Derek Perry (MA, TC Chair), Joshua Carloni (NH), Chad Power (NJ), Jeff Kipp (ASMFC), Conor McManus (RI), Allison Murphy (NOAA), Kathleen Reardon (ME), Chris Scott (NY), Burton Shank (NOAA), Somers Smott (VA), Corinne Truesdale (RI), Craig Weedon (MD)

Jonah Crab Stock Assessment Subcommittee (SAS) Members

Jonah Crab: Derek Perry (MA, TC Chair), Joshua Carloni (NH), Jeff Kipp (ASMFC), Kathleen Reardon (ME), Burton Shank (NOAA), Corinne Truesdale (RI), Jeremy Collie (URI)

Addendum XXVII PDT Members

American Lobster: Kathleen Reardon (ME), Joshua Carloni (NH), Robert Glenn (MA), Corinne Truesdale (RI), Allison Murphy (NOAA)

**DRAFT PROCEEDINGS OF THE
ATLANTIC STATES MARINE FISHERIES COMMISSION
AMERICAN LOBSTER MANAGEMENT BOARD**

**The Westin Crystal City
Arlington, VA**

**August 2, 2022
Hybrid Meeting**

These minutes are draft and subject to approval by the American Lobster Management Board.
The Board will review the minutes during its next meeting.

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INDEX OF MOTIONS

1. **Approval of agenda** by consent (Page 1).
2. **Move to approve Proceedings of March 31, 2022** by consent (Page 1).
3. **Move to postpone consideration of public hearings on Draft Addendum XXVII until the Annual Meeting to allow the PDT time to address challenges raised by existing MSA language regarding possession of lobsters smaller than the lowest minimum size limit specified in the American Lobster FMP. This could include language which differentiates harvest vs. possession limits to reduce impacts on dealers and processors. The LEC should also review new language that may be suggested by the PDT** (Page 10). Motion by Pat Keliher; second by Cheri Patterson. Motion carried (11 in favor) (Page 13).
4. **Move to approve Advisory Panel nominations for Eric Lorentzen and Todd Alger from Massachusetts, and Chris Welch from Maine** (Page 26). Motion by Dan McKiernan; second by Pat Keliher. Motion carried (Page 27).
5. **Move to elect Commissioner Pat Keliher of Maine as Vice-Chair of the American Lobster Management Board** (Page 27). Motion by Dan McKiernan; second by Emerson Hasbrouck. Motion carried (Page 27).
6. **Move to adjourn** by consent (Page 27).

ATTENDANCE

Board Members

Mike Armstrong, MA, proxy for D. McKiernan (AA)	Colleen Bouffard, CT, proxy for J. Davis (AA)
Pat Keliher, ME (AA)	Bill Hyatt, CT (GA)
Stephen Train, ME (GA)	Jim Gilmore, NY (AA)
Cherie Patterson, NH (AA)	Emerson Hasbrouck, NY (GA)
Ritchie White, NH (GA)	Joe Cimino, NJ (AA)
Dennis Abbott, NH, proxy for Sen. Watters (LA)	Peter Clarke, NJ, proxy for T. Fote (GA)
Dan McKiernan, MA (AA)	John Clark, DE (AA)
Raymond Kane, MA (GA)	Roy Miller, DE (GA)
Sarah Ferrara, MA, proxy for Rep. Peake (LA)	Mike Luisi, MD, Administrative proxy
Jason McNamee, RI (AA)	Russell Dize, MD (GA)
David Borden, RI (GA)	Pat Geer, VA, proxy for J. Green (AA)
Eric Reid, RI, proxy for Sen. Sosnowski (LA)	Allison Murphy, NOAA

(AA = Administrative Appointee; GA = Governor Appointee; LA = Legislative Appointee)

Ex-Officio Members

Kathleen Reardon, Technical Committee Chair

Staff

Bob Beal	Lisa Carty	Adam Lee
Toni Kerns	Emilie Franke	Sarah Murray
Maya Drzewicki	Lisa Havel	Joe Myers
Tina Berger	Chris Jacobs	Mike Rinaldi
Kristen Anstead	Jeff Kipp	Julie Defilippi Simpson
Pat Campfield	Dustin Colson Leaning	Caitlin Starks

Guests

Katie Almeida	Noah Cluster	Caroline Good, NOAA
Jordan Andrews, <i>Press Herald</i>	Colleen Coogan, NOAA	Melanie Griffin, MA DMF
Pat Augustine, Coram, NY	Heather Corbett, NJ DEP	Catherine Fede, NYS DEC
Rachel Barrales, Cape Cod CFA	Nicole Lengyel Costa, RI DEM	Jon Hare, NOAA
John Bello	Caitlin Craig, NYS DEC	Amalia Harrington, Univ. ME
Alan Bianchi, NC DENR	Maria Fenton, NOAA	Marin Hawk, MSC
Jeff Brust, NJ DEP	Marianne Ferguson, NOAA	Heidi Henninger, AOLA
James Burns	James Fletcher	Jay Hermsen, NOAA
Josh Carloni, NH FGD	Erica Fuller, CLF	Matthew Heyl, NJ DEP
Beth Casoni, MLA	Brian Galvez, NOAA	Jesse Hornstein, NYS
Danielle Chesky, Embassy of Canada	Marty Gary, PRFC	Jeff Kaelin, Lund's Fisheries
Matt Cieri, ME DMR	Lewis Gillingham, VMRC	Ellen Keane, NOAA
	Jennifer Goebel, NOAA	Kiana Kekoa, Ofc. Sen. Reed, RI

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Guests (continued)

Joelle Kilchenmann, Univ. ME
Nancy Koenig
Rob LaFrance, Quinnipiac Univ
Chip Lynch, NOAA
J A Macfarlan, RI DEM
John Maniscalco, NYS DEC
Eric Matzen, NOAA
Kim McKown, NYS DEC
Conor McManus, RI DEM
Meredith Mendelson, ME DMR
Steve Meyers
Henry Milliken, NOAA
Jack Molmud, NewsCenter, ME
Lorraine Morris, ME DMR
Gunda Narang
Lindsey Nelson, NOAA

Virginia Olsen, Local 207
Scott Olszewski, RI DEM
Michael Pentony, NOAA
Nick Popoff, US FWS
Chad Power, NJ DEP
Tracy Pugh, MA DMF
Brad Schondelmeier, MA DMF
Amanda Small MD DNR
Melissa Smith, ME DMF
Somers Smott, VMRC
Rep. Elizabeth Snyder, AK
Renee St. Amand, CT DEEP
Terry Stackhouse, WMTV
Lauren Staples, NH FGD
David Stormer, DE DFW
Jason Surma, Woods Hole Grp

Pam Thames, NOAA
Andrea Tomlinson
Corinne Truesdale, RI DEM
Mike Waine, ASA
Jessica Waller, ME DMR
Megan Ware, ME, DMR
Craig Weedon, MD DNR
Ashley Weston, NOAA
Kelly Whitmore, MA DMF
Erin Wilkinson, ME DMR
Chris Wright, NOAA
Jordan Zimmerman, DE DFW
Erik Zlokovitz, MD DNR
Renee Zobel, NH F&G

The American Lobster Management Board of the Atlantic States Marine Fisheries Commission convened in the Jefferson Ballroom of the Westin Crystal City Hotel, Arlington, Virginia, via hybrid meeting, in-person and webinar; Tuesday, August 2, 2022, and was called to order at 10:35 a.m. by Chair Jason McNamee.

CALL TO ORDER

CHAIR JASON McNAMEE: While we're waiting for folks to settle in here in the room, just one announcement. We're going to have a series of discussions on right whales, and I know there are some folks that may be in the back of the room from some of the southern states, that aren't necessarily on the Lobster Board.

But we welcome you to come up to the table and ask questions during that point in the agenda, if you wish. Just a reminder of that opportunity, if folks have questions about the speed rule or the ropeless work that's going on. Okay, looks like everybody is mostly settled in here, so why don't we get going with the agenda.

Welcome everybody! This is a meeting of the Lobster Management Board. We have kind of a hybrid thing going on here. It looks like most folks are in the room, but I know we have a couple of folks online as well. I think when we get to points of asking questions, and things of that nature, I'm going to look to the room first, and then follow up with the folks online, if that is okay.

APPROVAL OF AGENDA

CHAIR McNAMEE: With that, first I'll ask the question about the agenda. Are there any changes to the agenda that anybody wishes to make? Okay, no hands here in the room. Anybody online? No hands online, so we will call the agenda approved as submitted.

APPROVAL OF PROCEEDINGS

CHAIR McNAMEE: Next up are the proceedings from the last meeting. Are there any additions, changes, edits? Looking in the room here for any edits.

Not seeing any, anyone online? Nobody online either, so we will consider the proceedings approved as submitted. Great, thanks everybody.

PUBLIC COMMENT

CHAIR McNAMEE: Now is a point in time when we can take some public comment for things that aren't on the agenda. Are there any public in the room that wish to speak?

Did anybody sign up or anything like that, Caitlin? Okay. Nobody here in the room, anybody online that wishes to speak to anything not on the agenda? Okay, not seeing any hands, so we will keep moving along.

UPDATE ON JUDGE JAMES BOASBERG RULING IN THE U.S. DISTRICT COURT FOR THE DISTRICT OF COLUMBIA IN CENTER FOR BIOLOGICAL DIVERSITY VERSUS SECRETARY RAIMONDO AND THE MAINE LOBSTERMEN'S ASSOCIATION

CHAIR McNAMEE: Next up is a Discussion on the Judge Boasberg Ruling, and I believe we have Chip Lynch from NOAA here to talk us through that agenda item. Whenever you're ready, Chip.

MR. CHIP LYNCH: Hi everybody, Chip Lynch with NOAAs Office of General Counsel. As many of you are aware, we received an opinion from the Court on July 8th, identifying defects in NOAAs recent biological opinion and in its final rule from 2021. But in order to, I think better frame the conversation, I would like to take everybody back to 2017, because that is really when this all began.

As you recall, in 2017 scientists and other individuals started noticing a series of mortalities and serious injuries to right whales. It was unusual at the time, because in 2017 the prevailing belief

Draft Proceedings of the American Lobster Management Board Hybrid Meeting
August 2022

was that right whales were on a positive trajectory. NOAA and the states had implemented a number of rules in the past, protective measures, sinking ground line.

Massachusetts did its Bay closure, etcetera. It looked as though the population was responding positively. But in 2017 there was a number of these whale mortalities that undermined that belief. NOAA at that time convened the Take Reduction Team, which is a team that is created or identified under the Marine Mammal Protection Act.

It's a team of advisors, industry experts, scientists, managers. The charge was to look at this unusual mortality event. I mean that's what it was called. It had been termed a UME or an unusual mortality event, and to look at the condition of the species, and to come up with some ideas.

Around this same time, a number of environmental organizations brought suit, challenging against NOAA, essentially saying that NOAA needed to do more, and needed to do more faster. One of the ways in which this challenge took effect was to challenge NOAA's earlier biological opinion from 2014, sort of called a batched biological opinion, because it looks not only at lobster and Jonah crab, but at a number of fisheries up and down the coast.

That biological opinion concluded that it did not contain an incidental take statement, which is sort of a term of ours created by the Endangered Species Act. The case, which was brought by Center for Biological Diversity, I believe the Humane Society, Conservation Law Foundation, Defenders of Wildlife. That proceeded along, lawyers and everybody kind of had their own nomenclature on naming cases.

Center for Biological Diversity just happened to be the first name in the caption, so it's called the Center for Biological Diversity Case, even though it encompasses all those others, or the

CBD case. That case proceeded along, the TRT proceeded along, coming up with ideas to decrease whale mortality.

Then the Court, the CBD Court rule in April of 2020, and then a little bit after in August of 2020, and found that NOAA's earlier biological opinion was defective, because it lacked an incidental take statement. The judge in that case is Judge Boasberg. That is why you will all hear people talk about the Boasberg Opinion. That is what they are referring to.

The Court found NOAA's biological opinion defective, and gave NOAA time to cure that defect, which it did. In May of 2021, NOAA issued a new biological opinion, again it looked at impacts from Maine all the way down to Florida. It included not only lobster and Jonah crab, but other species such as bluefish, squid, mackerel, butterfish, scup, summer flounder, black sea bass, spiny dogfish, groundfish. It's a big, biological opinion, it's not just about lobster and Jonah crab. The opinion looked at what was at that time NOAA's intended plan to bring back whales, bring back the right whales.

That plan at the time was a phased approach to recover the right whale. There was a first phase, which was intended to be, at that time was going to be a rule. It turned out to be the September, 2021 rule, where NOAA and the states would implement regulations to achieve about a 60 percent risk reduction to the northeast trap fisheries, lobster, Jonah crab.

Phase 2 approach was going to achieve by 2023, was to achieve a 60 percent risk reduction in all the other fisheries, gillnet, Mid-Atlantic, trap pot fisheries, sort of leveled the playing field. Everybody gets a 60 percent risk reduction. Then there was going to be a third phase that was going to again look at all of the fisheries once again, and achieve additional risk reductions, and actually bring down mortality in whales or biological removal (you know, mortality) from fishing to about one.

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That was scheduled for 2025. Then a further rulemaking that would bring the number of whales well below one, or 0.136 or something like that by 2030. That was the plan. The biological opinion looked at that plan, said there was no jeopardy, good to go. NOAA then issued its Final Rule on the Phase 1 fishery, Phase 1 measures. That happened in September of 2021, so a little less than a year ago.

Those are the measures that you're all familiar with, the weak rope, the breakable links, some seasonal closures. Soon after that the environmental plaintiffs, most of them, renewed their challenge to the now new biological opinion, the 2021 batch biological opinion. It also challenged the 2021 rule.

We can get into it if you want, but for the purposes of this discussion, we'll simplify it to say that the challenge was that NOAA needed to do more, and needed to do more faster. At the same time, industry was involved in the case, but it had also brought its own case, Maine Lobstermen's Association, Massachusetts Lobstermen's Association, etcetera, essentially arguing the flip side of this same coin, challenging the biological opinion and the rule for some of the assumptions, the technical assumptions and math that NOAA did.

That case is also before Judge Boasberg, and we refer to that case as the MLA Case for Maine Lobstermen's Association, because they were the first in the caption. Those cases were proceeding forward, and we briefed the matter in the spring, and we got a decision from the Court this past July.

The July 8th ruling, is only a partial ruling. The ruling essentially states, the Court ruled in two parts, one part on the biological opinion, and one part on the 2021 rule. As to the biological opinion, the Court, and I have to clarify it's the judge sitting in with jurisdiction over the CBD case. The judge also has jurisdiction over the MLA case, again, flip side of the same coin, hasn't ruled on that. But as far as the CBD case,

the judge ruled and said, NOAA's biological opinion is again defective. Essentially the reason is because NOAA issued an incidental take statement, but the incidental take allowed was 0, and the Court said, you can't allow a fishery with a 0 ITS when your own documents say that the fishery is going to take something greater than 0, 2.65 I think is the number. As to the rule itself, the Court said, you need to get to PBR, which I'll define in a minute, within six months of the rule.

PBR is a term of art. It's a term under the Marine Mammal Protection Act, its potential biological removal, and essentially what it means is, how many whales can the fishery seriously injure or kill. That is a standard under the MMPA, and still allow the fishery to be at sustainable levels. The rule, scientists say that the current PBR, or at least the PBR at the time, was 0.7, so 0.7 whales per year.

I have to say that when we're talking about numbers, the numbers are great to add so it is not so esoteric. You're dealing with hard numbers. But they are only a snapshot at the time. The whale population, the models show the numbers altering slightly as you put more inputs and different inputs, but basically for the purposes of this discussion, PBR, potential biological removal for whales is 0.7.

The final rule that came out, or the plan being proposed by NOAA had this Phase 1, which would lower PBR all the way down from 4.5 to approximately 2.5, so almost cutting it in half. Then by the time you're getting down to this Phase 2, it's down to a little bit under 2.5. Phase 3 it's down to 1. Phase 4 at 2030 is, again as I mentioned before, down to 0.136.

The Court said, you need to get to PBR within six months of your rule, and if PBR is 0.7, then you need to get to 0.7 within six months of your rule, and this rule did not do so. The rule, again, was part of a plan to get to that number, but it didn't get to that number within six months. The Court said, these are the defects, we need to figure out what to do about this.

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It set up a further round of briefing, which we call the Remedy Briefing, you know the okay, now what briefing. We were just in front of the Court, and the Court set up a schedule and said that the environmental plaintiffs have to submit their remedy briefing by August 12. NOAAs is going to be September 19.

Some of the intervener defendants, such as Lobstermen's Association, will have their chance at briefing in early October, and the Plaintiffs get the final say on or around October 21st. What that means is the Court will be in a position to render a decision sometime after October 21st. The Court in its original opinion July 8th, did make note of how difficult a problem this is, and how there are tremendous impacts on all parties involved, including the fisheries in the coastal communities in New England.

I don't think it would be, if the briefing is done on October 21st, I don't think the Court will be able to round up an opinion by the 22nd, so we're talking probably an opinion a month or two after that, probably a holiday season. It could be later, but that is probably, consistent with past practices by this judge, that is where it would go.

There is one other intervening issue here though. Again, as I mentioned, the MLA case being brought by industry is still pending. The Court has not ruled on it. I mean you can't look at the CBD end of this case and not have a sense of where the judge is going. But nevertheless, there are important questions being raised in the MLA case that could bear on what the parties would say in the briefing on remedy in the CBD case. For example, the MLA case, the challenge there has been to some of the assumptions that NOAA has made in its modeling, and an allegation that NOAA is relying too much on the worse case scenarios to come up to its numbers.

Many would say we need to know what the Court thinks of that, because that will inform

where we need to go forward, how we need to go forward in the CBD case. The Court understood that and said, okay, the judge said that he would take briefing on that particular topic by August 5th, which is a couple of days from now.

We are waiting, or we will be waiting to hear from the Court, to see what it's going to do with the MLA case, and options would include. The judge could say, we will stay the case until sometime in the future, maybe even after the final decision in the CBD case, or even a rule that may come out by NOAA.

The idea being that depending on what the parties do here, it could obviate the need for the Court to rule in MLA. It could moot things out, or the Court could say, I agree there needs to be an opinion, and here it is, just issues its opinion in MLA, or the Court could say, we'll stay the briefing schedule until after it issues an opinion in the MLA case, which would happen probably forthwith. There may be other options that I haven't even thought about.

But that is pending, and that is what we're working on now. That which I've spoken to you is obviously generalized and probably over simplified in a way. But there are many moving pieces. There is a lot going on. There are even other cases involving whales. I'm happy to answer any questions you have on them to the extent that I can, to the extent that I know. But with that, I think that encapsulates where we all are in the process here.

CHAIR McNAMEE: Awesome, thanks so much, Chip, really complicated stuff. I think you boiled it down in a way that was understandable. Thanks for that. Why don't we take some questions for Chip, if anybody has any? I'm looking around the room. Okay, I'll go to you first, Pat.

MR. PATRICK C. KELIHER: Chip, that was a thorough presentation and there is a lot there. If you're not involved in it day to day, minute to minute, it might seem like this is something that is workable in many ways. But I'm wondering, and if it's too much to ask, I understand. But I'm wondering if you could put a finer point on the seriousness of the issues

related to, not PBR, but to negligible impact, and whether that can be reached. Because I think it's important for this Board in particular to understand the potential ramifications of this decision and where it's going.

MR. LYNCH: I can answer some of that. I can certainly give you my understanding of where we come up with this negligible impact thing. A negligible impact determination is a phrase of art. It's something that is in the law. You'll hear people talk about a NID all the time. That's what it is. It's the negligible impact determination. The negligible impact determination is the crosswalk from between the ESA, the Endangered Species Act and the Marine Mammal Protection Act. It comes up in this case, because one of the chief criticisms, or a criticism of the Court was that NOAA did not, originally, did not include an incidental take statement, which is a term under the ESA, in its biological opinion. Then NOAA put in a 0 incidental take statement in its biological opinion.

The crosswalk is that in order to issue an incidental take statement for whales, the Agency needs to make a determination that the continued action that it is consulting on will have a negligible impact on the survivability or the status of the stock in a sustainable way moving forward. It's not so simple as coming up with a rule that gets to achieve PBR, or this potential biological removal within six months.

The issue also involves being able to determine that the fishery, in getting to PBR, will have a negligible impact all the while. Now, PBR, and this is where I got out of my league, because I am not a scientist. PBR is a number that is, excuse me negligible impact determination number is a number that is equal to or less than the number for PBR.

I've seen scenarios where the negligible impact determination number is 50 percent of PBR. It can be 30 percent of PBR, it can be 10 percent of PBR. I don't have a precise number as to

what it is here. But suffice it to say, in order to get to negligible impact, well I mean let's just use common sense.

The word is what it says it is, it's a negligible impact, and it's something that the scientists would calculate as to what that number is. It's likely to be at, and quite potentially below PBR, maybe even significantly below PBR. Does that answer your question, Pat? I'm not sure I can get to.

MR. KELIHER: It does, but this is my perception, and if you believe I'm wrong you can tell me, but just for the Board's understanding. We believe that the potential to reach PBR is there to continue this fishery. We don't believe this fishery will be able to continue if we have to reach a negligible impact. That's where we are with this lobster fishery, an either/or scenario. We've got two steps. We've got an interim step for remedy, and then a final rule that then moves us out to PBR.

The timeframe on those things, you know are going to be argued in the Court. But I just want to make sure that this Board is clearly understanding the seriousness that this fishery faces, a billion-dollar industry on the east coast. The most valuable single-species fishery in this country could be closed, because of this tie between the Endangered Species Act and the Marine Mammal Protection Act. This has been my worst nightmare, and it's moving in that direction.

CHAIR McNAMEE: Go ahead, Chip.

MR. LYNCH: To underscore the gravity. I hope I didn't misdirect the Board. There will be a briefing remedy, and there will be a Court ruling. I don't know what the Court is going to say. The last time the Court found NOAA's biological opinion to be defective, the Court gave us time to correct it, and allowed the biological opinion to continue to exist in the meantime. My personal opinion notwithstanding, the reasonableness and necessity of such an approach. It's possible the Court could be even more draconian than that, meaning the Court could vacate the biological opinion. It's

possible. I didn't want to mislead anybody here to think that the Court is going to give time. It might.

CHAIR McNAMEE: Thanks for that. Jim Gilmore, go ahead.

MR. JAMES J. GILMORE, JR.: I'm not sure if this is a question to either Pat or Chip. Pat just said, so if they can't reach the NID it's a complete closure of the fishery, there is no option for? Not that it's a good solution, but I mean a reduction. Say if you said, well, if you reduced harvest by 50 percent hypothetically. That's not an option? You either have to have a fishery or no fishery? It sounds a little bizarre to me. But anyway.

CHAIR McNAMEE: Go ahead, Chip, if you feel like you can answer.

MR. LYNCH: I don't know that I can. I quickly get out over my skis when we talk about the specifics here. But suffice it to say that the severity of a potential result is not being overstated.

CHAIR McNAMEE: Thanks for that. John Clark.

MR. JOHN CLARK: Thank you for the explanation, Chip. Is this a uniquely bad situation because of the interaction of the Marine Mammal Protection Act and the ESA, and as such may be limited in its precedent, or could this just be the start of more draconian interpretations of these laws, and if so, is there any thought of appealing this? Who would appeal this? Would NOAA appeal this if it is as extreme as Pat is saying, where the fishery is closed, or would that have to be a state appealing this, or the Lobstermen's Association?

MR. LYNCH: Any party to the lawsuit can appeal the result. When you have in the CBD Case combined with the MLA Case, there is state, there are numerous industry groups, there are environmental organizations. Any of

them could appeal any potential result. As to the novelty of the situation, it is different, because it involves the interplay between the MMPA, the Marine Mammal Protection Act, and the Endangered Species Act.

Were this only an Endangered Species Act issue, we would be talking about that which could, the standard would be federal actions that jeopardize the continued existence of the species, and we could issue a biological opinion based thereon, and reasonable and prudent measures or alternatives, depending on the finding, and we would issue an incidental take statement. With the Marine Mammal Protection Act there is this additional hoop to jump through. In this instance it does complicate matters.

CHAIR McNAMEE: Good, John? Okay, next up I have Dan McKiernan, and this will be the last question on this, and we're going to move on to the next agenda item. Go ahead, Dan.

MR. DAN MCKIERNAN: Thanks, Chip, great summary. I do have a question on a technical level. The biological opinion only dealt with the federal waters permit holders fishing in federal waters. Where does that leave the state fisheries, legally, in all of these deliberations?

MR. LYNCH: That is going to take a lot longer to answer, Mr. Chairman. The most acute issue would relate to the federal fisheries, or fisheries in federal waters, because that is what is at bar. There would not need be very many ripples from where the stone falls to eventually hit the state fishers. Right, I mean everything is related.

We're talking, and everything is related in perhaps my oversimplified version of, at the end of the day we are talking about ways to preserve the resource. By that I mean the right whale resource, and how and when and means and methods to do that is something that I just would not be in a position to be able to talk about. I just don't know about it. But I think the gist of your question, Dan, is that would there be reverberations. Yes, I can't imagine how there would not be.

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CHAIR McNAMEE: Okay, thank you very much, Chip, that was a tough one. Good job doing the best you could to answer the questions. We really appreciate the opportunity. We're going to move on to, sorry, go ahead, Steve.

MR. STEPHEN TRAIN: It's not your fault, I've been holding my tongue, because I'm afraid once I get started, I may have trouble stopping here. Chip, I appreciate every bit that you said, and when I ask these or make these statements, it is not out of ignorance or stupidity nor anger. What I'm trying to understand, and I guess I'm saying it now so it is on the record.

The goal of both of these federal acts is to make sure we don't kill whales. Essentially this is what it comes down to. That is what is being applied, that's why there is a lawsuit. In over 25 years of research by your own Agency and studies, there has never been a case of a fatality caused by Maine lobster gear, not one documented case.

To the best of my knowledge, there have only been two entanglements, and they were freed or released. I understand the law is not specific. I understand the ESA has the term pose risk. But all of this is done to accomplish a goal, that it appears we have already met, and there is the overlying threat of closing a fishery to meet it.

I don't see how we have defense for this. I mean I understand why you're in this position you're in at NOAA, when it appears we've done what we've had to do to accomplish the end goal. Yet we're being challenged again by one agency or another, or one NGO or another, by a judge who is required to enforce the law.

I guess what I'm leading to with all of this. I told you I might go too long. How do you see this working forward in the next two or three months? I mean I know 5,000 families whose income depend on this fishery, that we've managed very sustainably, and we get something thrown from the stands instead of the outfield.

CHAIR McNAMEE: Chip, do you want to take a shot at it?

MR. LYNCH: I'm not sure I can say a whole lot more than, I hear you. This is an extraordinarily difficult situation for all people to be in. I hear you. Whales are in the ocean. It's unlike documenting what happens to a species that is terrestrial. There are few sightings of whales that can be attributed to any one state. I think that is part of the problem. I can understand Maine people saying that they haven't seen a whale. It hasn't been documented mortality from Maine gear. I think most states can say that though, because whales don't have gear that can be attributed to a particular fishery or area, sometimes they're dying out at sea.

But it makes it extraordinarily difficult. As to where this is headed in the future. Tough to say, because so much is going to be dependent on what the Court says next. I can tell you that the Agency, NOAA, is committed to moving forward, because there is no other option. What that looks like remains to be seen. I wish I could give you a better answer than that. I know it's not fulfilling, but I think that is about as much as I can say.

CHAIR McNAMEE: All right, thank you, Chip, let's move on to the next item.

**DISCUSS IMPLICATIONS OF PROPOSED MEASURES
OF DRAFT ADDENDUM XXVII ON INCREASING
PROTECTION OF SPAWNING STOCK BIOMASS OF
THE GULF OF MAINE/GEORGES BANK STOCK**

CHAIR McNAMEE: The next item on the agenda is a discussion on Addendum XXVII, which is focused on Increasing Protection of Spawning Stock Biomass of the Gulf of Maine/Georges Bank Stock. Caitlin has a brief presentation, and then we'll get to our discussion. Caitlin, whenever you're ready, take it away.

MS. CAITLIN STARKS: I'm just going to go over where we currently stand with Draft Addendum XXVII, which is on increasing the protection of the spawning stock in the Gulf of Maine and Georges Bank. I'll start off with some background quickly,

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and then review the proposed management options in the document.

Then I'm going to outline some of the concerns that have been brought forward, related to the proposed gauge sizes in the document. Then lead the Board into discussion on how to move forward. Just to recap really quickly the history on this. The Board initially initiated this Addendum in August, 2017, and that was in response to concerns about decreasing trends in Maine's larval settlement survey, and the potential for future declines in recruitment and landings.

At that time the Addendum focused on standardizing management measures across the lobster conservation and management areas or LCMAs within the stock. Then draft Addendum XXVII was put on hold for a few years, as the Board had to prioritize work related to right whale risk reduction efforts.

Then in February, 2021, after approving the 2020 benchmark stock assessment, the Board reinitiated work on this Addendum with a new motion that changed the focus of it to consider a trigger mechanism, such that upon reaching that trigger, measures would be automatically implemented to improve the biological resiliency of the Gulf of Maine and Georges Bank stock.

That was responding to trends since the Addendum was initially started, which have continued to be a concern with the settlement surveys over the past five years remaining below the 75th percentile of their time series. We've also seen declines in recruit abundance in the ventless trap survey and trawl surveys for the Gulf of Maine and Georges Bank stock since that 2020 assessment.

Considering all that information, the Board updated the objective of this Addendum to this statement on the screen, which focuses in that trigger mechanism that when we reach that trigger, it would automatically implement

measures to increase the protection of spawning stock biomass. After we reinitiated this in February, 2021, the Board did approve the draft Addendum for public comment in January of 2022. But at that same meeting the Policy Board decided to delay the release of the document for public comment, because there were concerns that upcoming actions and information could impact the ability to get useful public comments.

In particular, thinking about upcoming information on the stock condition from data updates that could impact the trigger index in the draft Addendum, and also some potential management related to right whales, which we've been talking about this morning. The states also wanted the opportunity to hold safely some in-person hearings before any Commission hearings.

That is where we left off with this Addendum, and then I quickly want to refresh everyone's memory, and go through the proposed management options in the Addendum. This Addendum has two separate issues in it. Issue 1 is addressing the standardization of a subset of management measures within the LCMAs and across the Gulf of Maine and Georges Bank stock.

Then Issue 2 considers applying either a trigger mechanism, or a predetermined schedule for implementing biological management measures that would be expected to provide increased protection to the spawning stock biomass. Just for reference, these are the current measures for the areas within the Gulf of Maine and Georges Bank stock, which are Area 1, 3, and Outer Cape Cod.

As you can see here, there are differences between each of the areas for pretty much each of the measures. Then under Issue 1, the two main options are Option A, status quo, or Option B, which is to implement some standardized measures upon approval of the Addendum. Option B has four sub-options to define what those standardized measures would be.

B1 would be standardizing measures only within LCMAs where there are current discrepancies, B2

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includes standardizing the V-notch requirement across the LCMAs. B3 would standardize the V-notch possession definition, and B4 would standardize the regulations for issuing additional trap tags for trap losses.

It's important to note here that the Board could choose multiple of these sub-options from the list, depending on which issues they would want to address. Then Issue 2 focuses on implementing management measures to increase the protection of spawning stock biomass. The proposed options under Issue 2, consider changes to the minimum and maximum gauge sizes, along with corresponding vent sizes for the LCMAs within the stock.

Those would be expected to both increase the spawning stock biomass, and result in the minimum gauge size increasing to meet or exceed the size at 50 percent maturity for each LCMA. The vent sizes would then change according to the final minimum gauge size that gets implemented in each area.

There are two proposed approaches again for implementing these changes to the gauge sizes. The first approach is to establish a trigger mechanism that would have a predetermined set of management measures that would be implemented upon reaching a defined trigger level based on changes in recruit abundance indices. Then the second approach would be to establish a predetermined schedule for future changes to the management measures. Options A through D, which I'll go through, use that first approach with the trigger mechanism, and Option E uses the second. These are the five options under Issue 2.

We have Option A, no additional changes to the measures, B is the gauge size changes would be triggered by a 17 percent decline in the trigger index, and then additional changes would be triggered by a 32 percent decline in the index. Option C is that gauge sizes would be triggered by a 20 percent decline, and then additional

changes triggered by a 30 percent decline, and D is that a 17 percent decline in the index would trigger a series of gradual changes in the gauge sizes over several years.

Then lastly, Option E considers changes to the minimum gauge size in LCMA 1 only, on a predetermined schedule, as opposed to being triggered by the index. I'm going to run through these fairly quickly, because they are in the document and we've seen them before. But these are the proposed measures that would be implemented, if each of the two triggers is reached under Option B.

You see the minimum gauge size at LCMA 1 increasing to 3 and 5/16 of an inch in the first trigger set of measures, and then in the second trigger you have a change to the minimum gauge to 3 and 3/8 of an inch, and also the maximum gauge size in LCMA 3 and Outer Cape Cod. Option C is identical to Option B with the exception of what the trigger levels are.

Whereas it was 17 and 32, these are 20 percent and 30 percent declines in the index that would trigger these measures. Then Option D considers implementing the gradual changes in gauge sizes, which would be triggered by a 17 percent decline in the trigger index, to start. The minimum gauge size would increase in 1/16 of an inch increments, and the maximum gauge size would decrease in increments of 1/4 inch.

The first gauge size again, would be triggered by 17 percent decline. Then after that first set of changes, the incremental changes to the gauge sizes would occur every other year as shown in the table. Then the vent size in LCMA 1 would be adjusted only once, to correspond with the final minimum gauge size change in Year 5. This is a reminder of what the trigger index that is being proposed to trigger these management measures looks like.

The combined index is shown in the upper left panel, and the other panels show the three datasets that go into that combined index, and this is for the available time series through 2020. Each of the

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proposed trigger levels considered in this Addendum are shown with the horizontal dashed lines. We've got 17 percent to 32 percent shown there. Then this is our last option, Option E, which is to establish a schedule for changes to the minimum gauge size in LCMA 1 only.

This would increase the minimum gauge size from its current size to 3 and 5/16 of an inch in the 2023 fishing year, which is how it was proposed back in January, when this was approved. Then two years after that the final adjustment would be made to the minimum gauge size in Area 1 to 3 and 3/8 of an inch, and the vent sizes would also be adjusted according to that.

Since the Board met last in March, and this Addendum was approved for public comments, a concern has been raised about the minimum size that was proposed for LCMA 1 in the Addendum options in Issue 2, and implications that they could have for commerce. Specifically, the options proposed an increase in the minimum size in Area 1 from 3 and 1/4 of an inch to 3 and 5/16 of an inch. But Magnuson-Stevens Act, as written, prohibits the import and sale of lobster smaller than the minimum possession size, in effect under the Commission's FMP.

Since Area 1 has the smallest minimum gauge size, the concern is that increasing it would result in lobsters under 3 and 5/16 of an inch not being able to be imported from Canada any longer. This could obviously have potential impacts on the market and supply chain. As we just heard from Chip Lynch, there is a likelihood the states might need to implement changes to the fishery in the near-term, to address right whale serious injury and mortality.

We're not sure what impacts those might have on the stock and the fishery at this time. These are two concerns that have been brought forward, and the Board may want to discuss today. Given those, I'm looking to the Board for

some discussion and guidance on how to proceed with Draft Addendum XXVII at this time. That is my last slide, so I can take any questions.

CHAIR McNAMEE: Great, thanks so much, Caitlin. Nice presentation, and you got through that quickly, so nice work. I'm going to give an opportunity for questions for Caitlin, but first I just wanted to lead in here a little bit to say, so we have this document that we've been working on. This is a possible action item on the agenda, so we've got a couple to pass. There are probably more than a couple.

But at the highest level we could conceivably dispense with this document today and get it out, or think about delaying based on some of the concerns that have been brought up. If we can kind of focus on those two paths, at least to start, hopefully that will kind of get us to, we only have about 20 minutes for this agenda item, so we can't spend too, too much time on it. With that I will go to questions, and I saw Dan McKiernan's hand first. Go ahead, Dan.

MR. MCKIERNAN: My question is a technical one regarding Magnuson. Is it unique to lobster that there is a prohibition on imported undersized animals from out of country? In other words, do we allow the import of undersized, say cod or halibut under Magnuson?

MS. STARKS: I can attempt to answer. I believe it is specific to lobster. Bob, if you know more, please jump in. But the language that I'm looking at specifically says for *Homarus americanus*.

CHAIR McNAMEE: Okay. Other heads were nodding in the room, so I believe that is correct. Other questions for Caitlin, before we get into the discussion here. Is there anyone online, Caitlin? Just sort of multitasking at this point. Okay, no hands online. Pat.

MR. KELIHER: Mr. Chairman, if you don't have any more questions, I would be happy to put a motion onto the board.

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CHAIR McNAMEE: Okay, one last pass through the room here for hands. Not seeing any; so Pat, if you would like to make a motion to kick us off here, please do.

MR. KELIHER: Great, and I believe staff have this, if they wanted to load it up. Thank you, and if I get a second, I'll give some additional rationale. But I think after today's conversations you probably all understand it. **Move to postpone the consideration of the public hearings on Draft Addendum XXVII until the Annual Meeting to allow the PDT time to address challenges raised by existing MSA language regarding possession of lobsters smaller than the lowest minimum size limit specified in the American Lobster FMP. This could include language which differentiates harvest vs. possession limits to reduce impacts on dealers and processors. The LEC should also review new language that may be suggested by the PDT.**

CHAIR McNAMEE: Okay, thank you. We have a motion on the table and looking for a second. I see multiple hands; I saw Cheri's first. Cheri Patterson gets the second. Let's open it up for discussion. Pat, do you want to speak to your motion?

MR. KELIHER: Yes, thank you, Mr. Chairman. I mean clearly the Magnuson issue is raised within the motion itself. I've spent a lot of time talking to dealers and processors who live in Maine that probably handle between 50 and 75 percent of the product that come through, and learned clearly what the impact would be on those businesses, especially in the springtime of the year.

It doesn't seem like a lot when you're talking about a gauge size change of 16th of an inch, but if they are not allowed to bring that product in at certain times of the year, especially considering the increased yield that they have out of those harder shell lobsters. It's a massive economic hit to them, so it reverberates through the market chain.

For those reasons, I believe we need to make sure we understand exactly what the ramifications are, and if there is a way around it. I believe looking at harvest vs. possession, because the Magnuson Act is specific to possession. There may be a solution here. I want to make sure it's clear. My goal is not to continue to kick the can down the road on this Addendum. We need this Addendum, from a resource standpoint.

But we need to resolve these other issues. Lastly, I will just say, without belaboring the issues. We heard a lot about whales today. Understanding at least the direction that the Agencies may be going in with remedy, and what the ramifications are, and what that means to the lobster harvest itself. That may play into, I know we don't like to use resiliency anymore, but it may play into the stock resiliency, and certainly benefit the spawning stock biomass. With that I'll end my conversation.

CHAIR McNAMEE: Cheri, do you wish to add anything?

MS. CHERI PATTERSON: Pat definitely covered most of it. I think the one thing I just wanted to add is, without having clarity for law enforcement with this MSA concern. I think we just need to wait until this gets resolved, so that it's actually something that is enforceable in the future, if need be.

CHAIR McNAMEE: Others wishing to discuss. Go ahead, Dan McKiernan.

MR. MCKIERNAN: I hope that we would entertain discussing with Canada the potential for them to increase their minimum size along with us, because I recall when the Mitchell Bill, I guess this is my Tom Fote imitation. When the Mitchell Bill was enacted back in the early nineties, I think it was in response to the industry being upset about the small Canadian imports being on the market.

It seems like if we do survive the hurricane that is the litigation on right whales, I could foresee a very similar outcome. I think it would be prudent to at least consider requesting Canada, since we do share

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to some degree that Gulf of Maine stock with them, to see if they would consider going up with us, and make our lives that much simpler.

CHAIR McNAMEE: Is there anyone on line, Caitlin?

MS. STARKS: Alli Murphy.

CHAIR McNAMEE: Alli Murphy from NOAA, go ahead, Alli.

MS. ALLISON MURPHY: I just wanted to say, I think that this is a reasonable path forward here. I've been a part of the Addendum XXVII PDT, and look forward to continuing discussions with this, and pulling in other NMFS folks as needed to work through this issue. Thank you.

CHAIR McNAMEE: Thank you, Alli. I've got another online, David Borden. Go ahead, David.

MR. DAVID V. BORDEN: If it's an MSA problem, then is it going to require a Congressional action to change the language? That is one question. The other concern I've got about this. We started this Resiliency Addendum, I think in 2017, if my memory is correct, for a very good reason. We wanted to avoid a situation like the situation that developed in southern New England. The longer we go with this, the more difficult it's going to be to do this. I'm also getting more and more concerned about these indices, which continue to trend down.

If that continues, what you're going to find is, based on the experience from southern New England, is that the industry will get their backs up much more on even minor changes, because the changes will have really pronounced negative economic impacts. As I have echoed at prior Board meetings, the time to do this is when the resource is in relatively good shape, when it's in horrible shape, like the southern New England resource, it becomes that much more painful.

CHAIR McNAMEE: Thanks for the comment, David, and I think we have an answer to your initial question there, so Caitlin, go ahead.

MS. STARKS: I believe that the way the language is written in MSA, is it prohibits transfer, offer for sale, selling, purchase of any whole live lobster smaller than the minimum possession size in affect under the American lobster FMP. I believe if we thought about changing the language to a harvest size, rather than a possession size in the FMP, that we could avoid this. But that is my initial read, so I think it would be worthwhile to have the PDT take a closer look and discuss it.

CHAIR McNAMEE: Good Dave, okay great. Maybe I'll ask a quick question first, and looking to my colleagues here at the Commission. We have this motion to delay; it is to kind of investigate this MSA concern. We think there is a potential path here that Caitlin just offered. But is there a mechanism between now and annual meeting to kind of sort through this? Is there a plan there?

MS. TONI KERNS: Jay, we can work with NOAA Fisheries and the PDT, to the extent to try to resolve this, as long as there is a path forward to do so. I just don't want to guarantee it.

CHAIR McNAMEE: Understood. At least the mechanism was just the ability to kind of get whoever together, to see if there is a way, so that we have something to report in October or November, whenever the annual meeting is. Okay, great. Steve Train, go ahead, Steve.

MR. TRAIN: I'm going to support the motion to delay, not because I want to delay this action. Dave Borden said that very well. The indices are turning the wrong way. I'm going to support the motion to delay, because it's an enforcement issue that needs to be done. It needs to be straightened out before this can happen. I do think convoluting this with possible whale action is the wrong reason not to do it.

I think we need to move forward with this, if we see those triggers. This doesn't mean it's mandatory, it

doesn't mean it's going to have to happen. But to have the opinion that there is too much hitting us at once, when there are separate issues, and this is a resource health issue, doesn't sit well with me. I think we need to separate the issues. I'm glad that that is how this deals with this, it's enforcement, not other issues hitting us.

CHAIR McNAMEE: Eric, go ahead.

MR. ERIC REID: I just had a question about process. If this motion passes today, we're going to find out the results of the investigation, let's call it an investigation, in, when is our annual meeting, beginning of November, right? What happens then? If there is a way forward, whether it's changing the language in the plan, is that a framework? What does that look like, and then what does that do to the underlying efforts timeline?

CHAIR McNAMEE: Good question, Eric. Is there a response? Caitlin.

MS. STARKS: Yes, I can take a stab at that. I believe that in November, we could come to the meeting, we the PDT, with some recommendations for how to modify this document, specifically to address this issue. At that time, if those modifications are possible and completely resolve the problem, and the Board is comfortable moving forward.

Then we could just take the document out for public comment after the November meeting, so probably during holiday season, and maybe come back before the Board at the February or late January winter meeting for considering it for final approval. If I could just add one more bit of information that might help. The index that I showed earlier is through 2020, and the TC is currently working on updating that through 2021. I think we would have a better idea of where the index stands, in relation to the trigger points that have been identified in the document. If the Board wished to, I think modifying those trigger points would be within

the prerogative of the Board, based on where we are with that trigger in 2021.

CHAIR McNAMEE: Thanks, Caitlin, are you good, Eric? Okay, Dan McKiernan, go ahead.

MR. MCKIERNAN: Caitlin, as a follow up to Eric's question. It seems to me like there are three different paths forward. One is modification to Magnuson, which is statutory, which sounds pretty challenging. Modification to federal regulations, which could be done, but it would take longer. But then modification to the Addendum itself, regarding possession, etcetera. Are all three of those going to be sort of examined by the staff in the interim? Is that the thought?

CHAIR MCKIERNAN: Go ahead, Bob.

EXECUTIVE DIRECTOR ROBERT E. BEAL: Maybe I'll take those in reverse order. Yes, definitely the staff and the PDT will look at the Addendum modifications. We can talk with NOAA, your second option, about federal regulatory modification and the timeline associated there.

I think modifying Magnuson, everything that we're hearing right now is there is probably going to be no motion on modifying Magnuson, you know, unless there is something tucked into another bill that Congress is moving forward. That is usually risky, and with something as big as Magnuson.

It often doesn't go very well, just trying to get one or two sentences modified in another Congressional action. We can investigate that a little bit. But I think that option of updating Magnuson to either remove this language about the import size limit. I wouldn't count on that one being a viable option, or a very timely option either.

CHAIR MCKIERNAN: Are you good, Dan? Okay. All right, looking around the table, not seeing anybody with hands up here, online is there any hands? No hands online. Maybe I'll take a moment to see if there is any public that wishes to offer, before we dispense with this motion, any comments or

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questions? Nobody in the room here, no hands popping up online.

All right, so let's get to calling the question then. We've got a motion on the board, it's been seconded. All those in favor of the motion, oh, time out. Sorry, you've got it, Eric. We're going to call the question, so let's take a two-minute caucus, and we'll come back. I've got 11:48, we'll be back at about ten of. Thanks for slowing me down, Eric.

Okay, so the time limit is up. Does anybody need a little more time? Flag me down here at the table, or raise your hand online if you need a little more time. Not seeing any. All right, because we have sort of two parallel universes operating here, what we're going to do is, I'm going to call the question for the folks in the room, and then I'll do the same for the folks online. We'll tally all of those. All at once, oh, okay. We're going to go simultaneously. When I call the question, folks in the room please raise your hand, and folks online also, please raise your virtual hand. Oh, we've got a timeout, go ahead, Dan.

MR. MCKIERNAN: I think that's a little bit of a challenge, because one of our members of our delegation is not present, so I think you only want one hand from Massachusetts, for example. I don't think you want a third member of the delegation to vote.

MS. KERNS: What I'm just saying is that like for example, Alli is not here, so Alli will be raising her hand online. But I assume that the delegations have worked out who will be raising their hand for their state. I will call your state name. Please do not lower your hand until after I've said your name.

CHAIR McNAMEE: I made the same assumption, and we know who you all are, so we'll know if somebody is trying to trick us. Back to the question. **All those in favor of the motion, please raise your hand.**

MS. KERNS: I Have NOAA Fisheries, Rhode Island, Massachusetts, Connecticut, New York, New Jersey, Virginia, Maryland, Delaware, Maine, and New Hampshire.

CHAIR McNAMEE: Okay, anyone opposed to the motion, please raise your hand. Okay, no hands, any abstentions, please raise your hand? No hands, and finally any null votes, please raise your hand. No hands. **We had 11 in favor, no one opposed, no abstentions, no null votes. The motion passes.** We will be talking about this again in early November. Thanks for that everybody.

UPDATE FROM NOAA FISHERIES ON ONGOING ACTIONS RELATED TO NORTH ATLANTIC RIGHT WHALES

CHAIR McNAMEE: All right, so we're going to move on with the agenda. The next agenda item is another discussion on North Atlantic Right Whales. There are two components of this discussion. I'm not sure who all is speaking to it, so I apologize for not recognizing. Oh, I do have that.

PROPOSED RULE NORTH ATLANTIC RIGHT WHALE VESSEL SPEED REGULATIONS

CHAIR McNAMEE: All right, so if it's okay, we would like to talk about the Speed Rule first, and I believe Caroline Good will be giving that information to us. Caroline, are you ready?

MS. CAROLINE GOOD: I am indeed, thank you.

CHAIR McNAMEE: Okay great, take it away.

MS. GOOD: Today I'm going to be talking to you about a new proposed rule that we actually just released yesterday. This has to do with modifying the current North Atlantic right whale vessel speed regulations along the U.S. East Coast. Just to start off, I wanted to review the current speed rule regulations for everyone.

The current rules were put in place in 2008, following a series of events of right whale strikes along the U.S. coast. These restrictions place mandatory 10 knot speed limits on most vessels

equal to or greater than 65 feet in length in these specified seasonal management areas along the U.S. coast. They are collectively effective between November 1st and July 31st every year, although as you'll see, they turn on and off at different times, depending on when right whales are likely present in those areas. The speed regulations also include a special safety deviation provision, whereby vessels may exceed the 10-knot speed limit if they encounter conditions that may severely impact vessel maneuverability, and they make a special notation in the vessel log book.

There are also on certain vessel types and categories that are exempt, including military vessels, federally owned or operated vessels, vessels that are engaged in active search and rescue, or enforcement activities as well. We conducted a broadscale evaluation of the compliance with the current rule, and found that current compliance levels exceeded 81 percent, and they had essentially gone up year after year since 2008, when the rule was first put in place.

This is a very busy, active vessel transit corridor. We documented more than a million nautical miles of transit distance each year within these active, just during the periods of the year seasons, when these seasonal management areas were active. I'll also note too that the vessel types that we found that most frequently were exceeding that 10-knot speed limit, tended to be ones, unsurprisingly, that are designed for speed, and included container ships and pleasure vessels, so these could be large luxury yachts, they could be large sportfishing vessels, that sort of thing.

Again, these are all vessels that are designed for speed, and are also racking up a lot of, again, transit distance within these areas. I also want to comment briefly on our current voluntary speed programs as well. We will right now declare voluntary dynamic management areas or slow zones along the coast, when either three right whales are detected in proximity, or

right whales are acoustically detected outside of those active seasonal management areas.

We will declare a DMA or slow zone boundary around those for usually 15 days, and request that vessels transit at 10 knots through those areas or avoid those areas. In 2021, just to give you an idea, we had 67 such DMAs or slow zones declared along the coast. You can see on the map here.

But the key takeaway I want to highlight about this voluntary program, is that cooperation with this program is fairly poor. Despite our efforts to get the word out, to ensure that mariners are aware of this, we just are not seeing a level of cooperation that we need to really get sufficient conservation benefits for the whales from this program.

I'll also note too that this program was released in 2008, concurrently with the mandatory speed restrictions, and at the time this did indicate that if mariners did not cooperate at significant levels with this program, that the Agency would likely look at making something similar to this mandatory.

That brings us to today, and the proposed changes to the rule. We have four primary types of changes that are included. The first and probably most significant, are changes to the seasonal management area boundaries, both temporal and spatial boundaries, and also, we're going to be renaming the two seasonal speed zones, and that is just really to make it a little bit more obvious what they are, since a seasonal management area, they said oh, it could be anything. These changes would really substantially expand the spatial footprint of these areas. It almost doubles the area that would be covered under the rule. Most of that expansion is occurring in the Northeast and Mid-Atlantic, with more modest changes in the Southeast. But these changes are being put in place to address that misalignment that we are seeing between areas of elevated lethal vessel strike risk for right whales, and where the current boundaries are found.

Second thing the proposed regulation change would do is add additional vessel size classes into the vessels that are currently regulated. We would add

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vessels that are between 35 and 65 feet in length, and this is to address an ongoing problem with strike risk from this smaller vessel size class. We've had six lethal collisions that are documented in U.S. waters since 2006, involving this size class.

Third, we would create a new mandatory speed zone framework. This is somewhat similar to the DMA and Slow Zone program, but we would have different protocols for determining where these would be. But again, these would be again, temporary speed zones established when right whales are detected outside of the new seasonal speed zones, and they would be in place for a limited period of time.

We have some new protocols that I'll talk about later, about how those would be determined as well. Finally, we will also be making some updates to the safety deviation provision, and this is to enhance our ability both to monitor the rule, enforce the rule, and for safety of mariners. These updates would now require mariners who use the safety deviation exemption to report in electronically to NMFS within 48 hours of doing so, and to fill out some information.

Very similar to what is required right now in the vessel logbook entries, just so that we understand when and where vessels are needing to use that safety deviation. We would also be expanding the definition to, obviously the deviation to include medical emergencies, so if somebody has a heart attack or something, they need to speed in. That would also be included.

Then finally, because we're adding vessels that are smaller in size, we're also adding a special exemption for severe weather conditions for vessels that are less than 65 feet. Vessels that would be subject to regulation but transiting in areas where there is an active gale or hurricane warning or similar wind warning, would be exempt from those speed requirements, again for safety purposes.

As you can see here, the map on the right shows you in the light colors, are the new boundaries for the proposed seasonal speed zones. The dotted lines show you the current seasonal management area boundaries. Just to walk you through this very briefly. As you see up off Massachusetts, there is actually a combination of changes going on here.

We actually have some spatial and temporal contraction east of Cape Cod, with some areas we feel are no longer needed, based on our updated risk assessment model. But in other areas in the Mid-Atlantic, and again off Massachusetts, there is also spatial expansion in other areas where we are seeing that elevated risk.

As you move down the coast there is less expansion in the southeast region, and we do have a little bit again of a temporal contraction off South Carolina that will now be turning off April 15, as opposed to April 30, again, based on the data that we have. There is a new area added southeast of the current southeast SMA in Florida, extending down to Cape Canaveral. Again, due to areas where we are seeing potential elevated vessel strike risks in that zone. Another thing I just want to point out here is, all of these boundaries were based on a new coastwide risk assessment model that we developed, looking at the latest information we have on vessel traffic, and whale distribution and habitat use in that area.

It was aimed at addressing, along with the dynamic mandatory program, in excess of 90 percent of the risk that accrues from these vessels transiting at high speed, so over 10 knots in this area. I also want to note to that we did, as we looked at this, consider other ongoing factors that we know are coming up, such as for example, future wind development, also the U.S. Coast Guard has proposed new offshore fairways as well.

We did also look at that when we were identifying some of these boundaries. But in many cases what we found, interestingly enough, is areas that have elevated vessel strike risk right now, even before there is any offshore wind development, for example, would just essentially have additional development in that area.

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This would cover those future activities as well. Then regarding the addition of the 35-to-65-foot vessels. We've had a number of collisions in U.S. waters involving vessels within this size class, including again, as I mentioned earlier, six lethal events since 2005. We also have, in addition to that six, additional collisions that have been reported involving vessels between 35 and 65 feet, where the species of the whale was unknown, but the location and timing is potentially consistent with right whales.

We may have even more events that we don't actually understand involve the right whale. In many cases, especially with these smaller vessels, the vessel sustained significant damage. In a couple cases vessels have sunk, and in most cases, you have seven of the eight cases where the vessel operators do not see these whales prior to impact. This is really an issue of safety, both for the whale and as well for the vessel operators, when you're talking about vessels in this smaller size class.

Additionally, all of the other restrictions, regarding the exemption of military federal vessels, enforcement vessels, etcetera, would also apply to this size class, so they would not be included in vessels that would be included under the mandatory restrictions. Then with regards to these dynamic speed zones. These are designed to protect areas of right whale aggregation or extended presence in these discreet areas of limited time periods that would not be covered by the seasonal areas.

As you can imagine, there are certain times and places along the coast where right whale presence is more ephemeral, more unpredictable, or there is a more moderate risk, because the type of traffic transiting or the amount of traffic transiting is either not very fast, or there is the lower density of traffic.

These zones are established to address that risk where and when it's needed, without having to do a greater expansion of the seasonal speed zones. These again would be triggered either

by visual or acoustic detections outside the proposed mandatory seasonal speed zones. When we determine that there is a greater than 50 percent likelihood that the whales will remain within the zones, so this is an important new component that is different from the current voluntary program, because we want to ensure that the nature of the data that we have is consistent with whales likely to remain in the same spot.

There is no point in us requiring vessels to slow down if we think we have a situation where whales may just be heading through, and are going to be gone in two days. If that doesn't help the whales, then it puts an unnecessary burden on the regulated community. Also, what has triggered these dynamic areas would be announced via our official website.

We would also put out the announcement either through U.S. Coast Guard notices, National Weather Service Alerts, Apps, e-mail notification list, etcetera. We would also publish a notice in the Federal Register as well, because again, these are mandatory. We anticipate that most of these dynamic areas will occur in the Mid-Atlantic and Northeast.

If you look at this map here on the right, the zones that I've highlighted in pink are dynamic areas, based on the 2021 voluntary areas that were declared, that would have been declared had the SSZs been in effect already. We sort of tried to evaluate where they are most likely to occur. Again, we are mostly seeing a likelihood of those types of dynamic areas need to be in the Mid-Atlantic and the Northeast.

I also want to touch on some of the economic impacts to the regulated community. Based on our assessment, we estimate that just under 16,000 vessels could potentially be affected by the proposed amendments, at an estimated cost of approximately 46 million dollars per year. The majority of the affected vessels, about 60 percent, were recreational or pleasure boats.

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With about 22 percent large commercial ships, and 19 percent other types of commercial ships, industrial or other vessel types. I do want to note that when it came to evaluating the impact on vessels under 65 feet in length, particularly the large number of recreational vessels in this category. We overall aim to be more conservative, and overestimate rather than underestimate. But because many of these vessels lack AIS, we had to use some different methods to be able to evaluate how many vessels this may include. We likely overestimated that total number.

I'll also point out too that overall, even though we are including vessels within this size class. The vast majority of recreational boaters are likely to be not impacted by this, because most recreational boats are well under 35 feet in length, based on registration data between Florida and Maine. Finally, I'll highlight too that commercial ships would bear the majority of cost from these amendments, along with passenger vessels and industrial work vessels.

We also expect that certain types of vessels, including commercial fishing vessels and sailing vessels, although they are subject to speed restriction, would likely be less impacted by the restrictions, because the majority transit at speeds around or under 10 knots. Just because a vessel is subject to the speed restriction, doesn't mean they're going to be impacted by it depending on their normal, usual traveling speeds.

Finally, there is also some geographic differences, in terms of cost accrual, so about 89 percent of the cost we anticipate according to vessels operating in the Northeast and Mid-Atlantic, and this just has to do mainly with the enormous density of vessel activity in that area, relative to the Southeast averages. Just to sum up, the Rule is out as of yesterday morning. It is going to be open for public comment until September 30, and obviously we very much welcome comments on the proposed rule. There are definitely a lot of changes in the rule,

and so we are eager to hear from members of the regulated community in particular.

Also, we are working very hard to finalize the Rule before the end of the calving season next year, to provide additional protection to the mother/calf pairs, which are some of our most vulnerable members of the right whale population, especially from a vessel strike perspective. We'll be working very quickly to get this Rule into a final stage. That's about it, thank you.

CHAIR McNAMEE: Excellent, thanks so much, Caroline, great presentation. Just a quick time check here. We're a bit behind. I'm going to give an opportunity to ask Caroline some questions. I'm just asking that folks be succinct with their questions. Then we'll roll into the next presentation from John Hare. Questions from the Board for Caroline, and I saw Senator Miner, go ahead.

SENATOR CRAIG A. MINER: My question is, who provides enforcement of this Rule? If this was a speeding enforcement on a highway, and it came in at 81 percent, someone would be doing enforcement. I'm just curious as to how the enforcement is done.

MS. GOOD: Certainly. NOAA's Office of Law Enforcement is the primary enforcement agency. They bring official enforcement cases for the Rule. We do also receive assistance from the U.S. Coast Guard as well. We are actually in the process right now of doing really a top to bottom evaluation of both our current enforcement methods, as well as looking at potential changes needed for enforcement moving forward, particularly with the addition of the smaller vessel size class, between 35 and 65 feet.

We have very heavily relied, although not exclusively, on AIS data for a lot of the Rule enforcement. But only about, from our best estimates, about a third of vessels in the 35-to-65-foot class are currently using AIS. We've already taken some steps to prepare for some of these challenges. We are upgrading, you know our

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capabilities for tracking vessel speed at sea. We've initiated research into some new vessel tracking technologies. We're investigating land and aerial based monitoring options as well.

We've also had conversations with the U.S. Coast Guard. They've already actually stepped up some of their assistance for our current enforcement actions, as well as indicated additional assistance coming in the future as well, so that is very helpful. We've also had some early conversations with U.S. Coast Guard too, about potential expansion of the U.S. Coast Guard AIS on vessel requirements that might include vessels of smaller length as well.

CHAIR McNAMEE: Senator, okay? Next up I have Eric Reid, go ahead, Eric.

MR. REID: Part of your last answer helped me out a little bit. But when it comes to AIS, it's over 65 feet within 12 miles, so maybe that is going to change. My concern is about the unit itself, whether or not it has to be an AIS-A or an AIS-B unit, because of the range of the unit itself. Those are my quick questions, thank you.

MS. GOOD: Yes, so as many people know, fishing vessels and other vessels currently are only required to have a Class B AIS unit, which essentially means it transmits location a little less frequently than a Class A unit, which would be required on most large commercial ships, and other types of industrial ships.

Either of those for our purposes is fine. Either would provide sufficient information. Moreover, we are finding that there are both the official U.S. Coast Guard regulations regarding who has to have AIS. Then we also find that there are many vessels that may not be required to have AIS, but do so anyway, either because they are part of companies that require AIS, they have insurance policies that require AIS.

Also, they voluntarily use AIS for their own purposes for safety or interest, and just wanting

to be able to track vessels in their fleet, etcetera. There is a variety of reasons why people may use it, but we're well aware that not all vessels have it, and we already have been working for months on looking at additional options for tracking the speeds of vessels, and being able to enforce the speed rule, most importantly, on vessels that may not carry AIS.

CHAIR McNAMEE: Good with that, Eric? Okay, thank you, Caroline. We have one question from the public online. I have a question from Virginia Olsen, so go ahead, Virginia.

MS. VIRGINIA OLSEN: Thank you. My question is, how do you enforce ships that are flagged under foreign countries, and how would that change if this was mandatory? Thank you.

MS. GOOD: Sure, we currently enforce the speed rule on foreign flagged vessels all the time, and many vessels that come to U.S. ports for commerce and for trade are foreign flagged vessels, so that is a very common occurrence. They are still beholden to our federal regulations when they are transiting within U.S. Federal waters.

CHAIR McNAMEE: Great, thank you very much. Okay, I don't see any more hands up around the table or online, so thank you very much, Caroline. I appreciated the presentation.

OVERVIEW OF DRAFT ROPELESS ROADMAP STRATEGY TO DEVELOP ON-DEMAND FISHING

CHAIR McNAMEE: Let's move on now to the second topic, which is on ropeless gear, and I believe Jon Hare will be giving that presentation. Jon, whenever you are ready, feel free to take it away.

DR. JON HARE: Great, thank you very much, Dr. McNamee. I've just got a quick overview of the draft Ropeless Roadmap Strategy to develop on-demand fishing. Just sort of an overview, you know the intent of the roadmap, why a Ropeless Roadmap. The intent is to provide a unified vision of on-demand fishing gear adoption throughout fixed gear fisheries in our region.

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It's to help align partners and stakeholders, in understanding the technological and regulatory changes that are needed to implement the roadmap. We had committed, the Agency, NOAA Fisheries, had committed to producing a Ropeless Roadmap within one year of the batched fishery's biological opinion published in May 27, 2021. We're putting it out now, in July, now August, to receive public comment. One just sort of conversation on, you know Ropeless Roadmap, a strategy for on-demand fishing. You know those two sorts of ropeless and on-demand are synonyms, but they do sort of have different specific meaning. Ropeless implies no ropes at all, on-demand implies the gear is available on demand with or without rope, so we're using both currently, just to sort of make sure that the intent is understood. The next steps that we see for this strategy, again we put it out for public comment, so we're going to collect feedback from partners and stakeholders.

We're presenting at the Marine Mammal Biennial Conference, which is happening this week. We're also presenting at the Atlantic Large Whale Take Reduction Team meeting in August. Then we'll be talking about it at upcoming New England and Mid-Atlantic Fisheries Management Council meetings, and happy to spend more time talking about it, sort of going through it at a future Atlantic States Marine Fisheries Commission meeting, if there is interest.

Then we will refine the roadmap based on public feedback. We really see this as a living document. That term can be overused, but we continue seeing sort of editing and updating this roadmap as we make progress, and as we learn more about it. First draft is out, open for public comment. But then our vision is to work with all of you to continue to update this roadmap as we move forward.

What's in the roadmap itself? First it defines sort of on-demand fishing gear. It lays out the case for why on-demand fishing gear is needed,

and you heard about some of that earlier in this meeting. It talks about the current availability of on-demand fishing gear. It then lays out how on-demand fishing gear can be used. It touches on the regulatory requirements, and identifies sort of the stages of development of on-demand fishing gear operationally being used.

Step 1 is technological developing and testing. Step 2 is resolving gear conflict between fixed gear and mobile gear and other types of gear. Step 3 is expanding the experimental fishing, both to test the technology, and to test sort of ways that have been developed to resolve gear conflicts, and then Step 4 would be FMP and other regulatory changes needed to implement on-demand fishing gear throughout the region.

Again, why is on-demand, where is on-demand fishing gear needed? The roadmap does some evaluation of the decision support tool that is being used to decrease entanglement risk, to identify the proportion of vertical lines that pose the highest relative risk to North Atlantic right whales, and those areas could be sort of an emphasis for on-demand gear development and application. That is laid out in more detail in the strategy.

Then the other piece is, how do we locate gear that is deployed on demand, so no surface marker? Sort of the roadmap itself discusses the current developments in geolocation technology. It also lays the groundwork in a statement advocating for sort of an open-source nonproprietary technologies to be used in this space.

It can be a much more collective community development, as opposed to a one group developing and then selling the technology. That is just a quick outline of the roadmap itself. Again, we're asking for your comments. There is the link to our code, link to it or the link itself, it will take you to a questionnaire, where you can insert your comments. We're happy to come back to Atlantic States Marine Fisheries Commission in the future, and spend more time going through this if that is helpful. With that I'll stop and take any questions.

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Draft Proceedings of the American Lobster Management Board Hybrid Meeting
August 2022

CHAIR McNAMEE: Thank you, Dr. Hare. Let's have any questions for Dr. Hare. Jim Gilmore, go ahead, Jim.

MR. GILMORE: Hey Jon, I hope you're doing well. Are there any cost estimates that you guys are putting in for either retrofitting existing gear, or what those new gears would cost? Obviously, with some of the statements this morning about shuttering an entire fishery that we're talking big numbers, billions of dollars, so that might be helpful. Thanks.

DR. HARE: I don't think we have explicit cost estimates. I think there is some cost information about specific units. But you know at some point, understanding what the cost would be sort of fishery wide, that is a good suggestion, thank you. We have some people who are working on it, I'm just not quite sure where they are with their analysis.

CHAIR McNAMEE: Okay, thank you for that. Other questions, Megan.

MS. MEGAN WARE: Thank you, I'm contributing for Pat here for a second. I was curious, and Jon, this may be more a question for someone at GARFO. But I'm curious if there are any plans to have a bit of a coordination meeting between GARFO and the states, regarding more of the regulatory or EFP aspects of ropeless. We recently had a meeting with Science Center staff about ropeless, and I think that was a really fruitful conversation. But likely something on the regulatory side is also needed.

MR. HARE: Yes, thank you very much, Megan. You know we can certainly, we heard the comment, and I think useful, we kind of split regulatory and sort of science. But I think it would be good for us to start having sort of more just conversations that include all the parties. I certainly will make note of that and see if we can make that happen.

MS. WARE: Okay, great. Yes, I think there has been a couple EFPs that have come through the Federal Register recently. I think those have maybe shown some light on areas where we could improve communication. I think that would be great if we can organize something like that.

MR. HARE: Thank you for the comment.

CHAIR McNAMEE: Next up I have an online hand, David Borden. Go ahead, David.

MR. BORDEN: Jon, good report. I'm just curious about the gear conflict aspect of it. Are the NOAA staff looking at who is responsible for losses when they incur, if ropeless gear is being used? We've gotten to the point, at least with the offshore lobster industry, where 50 pot lobster trawls now cost almost \$22,000.00. If we get into a situation where there are no buoys on it, and there is some kind of interaction between fixed and mobile gear. Who pays the cost? Who is responsible for paying the compensation for the lost gear? Are your attorneys looking at that?

MR. HARE: It's a good question. I don't know, David, I can look into it and get back to you. I'll be at the Commission meeting tomorrow and Thursday. But that brings up, it's similar to Megan's point as well. There is a technological and science, but there are also the regulatory and legal pieces of this that we all need to make sure we're moving forward on sort of the same pace and taking steps together.

That is in part why the roadmap is out there, to help us coordinate around one document, one way forward. I'll see if I can touch base with GC before I get down to the Commission meeting tomorrow. But certainly, who is responsible for costs is an important question to ask.

MR. BORDEN: Thank you very much.

CHAIR McNAMEE: Just a quick time check. We're at time now. Toni said we can go to 12:50 without impacting the rest of the day, so try not to go that far, but just to give folks an idea of the slack that I'm

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looking at for this meeting. With that we have public question from Andrea Tomlinson. Andrea, go ahead.

MS. ANDREA TOMLINSON: Yes, hi, thank you so much, and thanks Dr. Hare for that presentation. I'm the recent founder of the New England Young Fishermen's Alliance, and I'm happy to report we had Zach Cliver from Blue Planet Strategies come down to our Deck Hand to Captain Training Program two weeks ago tomorrow, and do some demonstration on the ropeless gear work that he's doing in the Gulf of Maine.

My understanding through Zach is he has an EFP for the entire Gulf of Maine, and he's doing some hybrid research with the lobster industry from basically Northern Massachusetts up to Downeast Maine, with both ropeless and single vertical line gear. I just wanted everyone here on the meeting, to understand that we do have some reservations, obviously, from the young lobster fishermen that I found really revelatory, in that they are very concerned about, basically their reputation and their safety amongst the industry if they are participating in this research.

They wanted to ensure that there was full confidentiality if they were to participate in it. That was something I found quite striking, and just thought it would be interesting to share today. Then speaking with Zach Cliver from Blue Planet Strategies about that further. He did indicate that every participant in the program was very concerned about their confidentiality.

Basically, what my young lobstermen are saying is they feel as though there would be a target on their back, sadly, if they were to participate in this hybrid research project. That said, the major question from the trainees that are involved in the Deckhand to Captain training, six of them, four of which are young lobster sternmen being trained with business

management strategies and other strategies, to get into the captain's wheelhouse.

They are very concerned. Dr. Hare, to just touch on the previous comment, about the cost to their pocket. The industry cost to ropeless gear, because they were gasping when Zach shared that you know, he was using the bag inflatable model, they were gasping, you know their first question of course was, how much does this cost, and can we use 1-per-20 trap trawl, can we use 1-for-40 trap trawls. Zach was sharing that it cost 10 to 15 thousand dollars currently. I ensured them that would not be the cost in the future, if this were to be implemented in policy. Could you touch on what you see for financial compensation for the industry moving forward, if this were to go into effect?

DR. HARE: Yes, I don't want to sort of get ahead of myself. The industry financial compensation, there are conversations around that aspect at high levels. The other piece you touched on it as well is, sort of as the technology continues to develop, and more units are produced and sold. The anticipation is that the cost will go down. At this point we're still in an exploratory stage, trying to figure it out. In the future, the hope and intent are that it will cost less to deploy.

CHAIR McNAMEE: Okay, thanks for the discussion. At this point, I know there are other hands raised online. I will offer that both of the previous two presentations indicated how you could offer comments online, and into the process. I'll just sort of direct folks to that opportunity at this point. I did have one more hand from the Board, Steve Train. Go ahead, Steve.

MR. TRAIN: I don't think I've talked this much here in one day in years. I'm not against the concept that is presented here. It appears to do a lot of good, as far as the entanglement risk. What I'm against right now is the hopes that this is going to save us any time soon, because in practice this is currently extremely impractical.

The cost aside, David Borden once again hit the nail on the head. If a trawler doesn't know where my

gear is, it's going to trawl it up. They tell us that we'll have something on the boat that will tell us where these things are, because they'll be marked and they will be transmitting. But if every other gear type doesn't have that, it's not going to matter.

We are going to have ghost gear on the Gulf of Maine like you have never seen, with this type of thing. If it's a small dragger that doesn't have the capabilities of a scallop of one of the 90 footers. He'll be lucky to get his own gear back, let alone get our gear back. Those boats don't have that kind of power.

We're talking about stuff that is going to cost multiple industries hundreds of thousands, if not millions of dollars in gear conflict. The gear conflict between lobster boats. I don't know how these things are going to work on our boats. I don't know what the range is going to be. I don't know if when you go over the thing it's going to see it, or if it's going to tell you from four miles away.

But when you're fishing 40 and 50 trap trawls, if it doesn't show up on the screen and you start setting yours, you may be setting over here in 50, 80, 100 fathom or more of water. These boats aren't designed to get two 50 trap trawls aboard at the same time, especially when half of them are hanging down. This may work, but don't get your hopes up that it's going to be something we can do in the next two to five years to save this industry from the whale issue.

CHAIR McNAMEE: Thanks, Steve, any reaction to that, Jon?

DR. HARE: No, thank you very much, Steve. I know Henry Milliken and Eric Matzen are on, they are actively working on the ropeless, and sort of hearing from you where the bottlenecks are, as it were, just is very useful for us. Because I do agree, I think we all agree the gear conflict is at this point in time the hardest part of the technological problem that we're trying to address.

CHAIR McNAMEE: Okay, thanks for that discussion. Okay, Jon, thank you very much, good presentation. Thanks for fielding those questions. Before we move on to the next item, just looking around to the Board. We have two topics here with opportunities for public comment. Is there any desire from the Board to develop comments from the Commission to submit?

I'm not suggesting we try and wrangle that language together here at the table, but if we get a sense of whether there is a desire to do that, we can work after the meeting to kind of pull that together. Looking around, is there anyone who wants to comment on whether there is an interest? Pat.

MR. KELIHER: Yes, I'm assuming, Mr. Chairman, that most every state is going to submit some kind of comments. I know we're going to have lengthy comments. We appreciate some of the direction that the Agency is going here. But maybe a small workgroup of states that are going to compile comments. We could get together on a quick phone call, share our comments, and then craft something more general from the Commission.

CHAIR McNAMEE: Great, thanks, Pat. Go ahead, Toni.

MS. KERNS: Just to make sure that we're recognizing. The Speed Rule will need those comments faster, and it does impact all states. We can also reach out to some of the southern states that are not here right now, and see if they have any additional information, outside of just the Lobster Board.

CHAIR McNAMEE: Great, so it seems like there is interest, and we will figure out a mechanism to kind of pull those comments together after the meeting. Thanks to both Caroline and Jon for the presentations, those were great. All right, let's move on. Jeff, we are going to bump you from the agenda. I know you're broken up about that. I do apologize. We'll get you next time, we promise.

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**UPDATE ON FEDERAL RULEMAKING TO
IMPLEMENT EFFORT CONTROL MEASURES
AND HARVESTER REPORTING (ADDENDA XXI,
XXII, AND XVI PROVISIONS)**

CHAIR McNAMEE: We're going to skip the update on Jonah crab for this meeting, and go right to Alli Murphy, who is going to give us an update on another piece of federal rulemaking that is out for comment right now. Alli, whenever you're ready, take it away.

MS. MURPHY: We published a proposed rule a few weeks ago now, proposing measures that complement Addenda XXI, XXII, and XXVI. I'm going to use the next couple slides to kind of go into the details on what we proposed. Through this presentation, as well as the memo that Caitlin sent around, I'm also going to highlight some of the differences with what we proposed, and what was in those Addenda.

I figured I would start with perhaps the more easy one, which is harvester reporting. We're going to require, or we've proposed to require that all federal lobster permit holders submit electronic vessel trip reports, using the same form and timing that all of our other GARFO permit holders are being held to. In addition to that, at the request of Addendum XXVI and the subsequent Data Working Group, we were requested to collect several additional data elements. We're proposing 5 new data elements listed in that table.

In going through the process of developing the proposed rule and the Paperwork Reduction analysis, we identified three of those items that were recommended as duplicative, with information we already collect on the VTR. We have not proposed to collect those items. We welcome comment on this proposal.

We also welcome comment on the Paperwork Reduction analysis and burden estimates associated with this measure. One final thing to note here is that we propose to begin collecting this information no earlier than January 1st. I

had hoped to get this rule out a little bit faster than it actually did.

As we move into the final rule, we'll need to be thinking about workable implementation dates, you know balancing sufficient time for industry to get the technology and the appropriate Apps to comply with the reporting requirements, as well as balance that with need for the data. If there are comments on when to implement these measures, we would welcome those comments as well.

For Area 2, I'm going to try to be a little bit more purposeful in my wording, than perhaps I was in the explanatory section of the proposed rule. I know that caused some confusion. I've gotten some phone calls, where folks had some questions. We are proposing to cap Area 2 entities at a limit of 800 traps per entity.

Those who were over that 800-trap cap as of the time of the proposed rule, we are proposing to allow them to retain their current trap allocations, but not acquire any additional traps afterwards. We're also proposing to implement that on May 1, 2024, consistent with the 2-year sunset provision that had been in Addendum XXI.

The real big difference here is that we are not proposing, well two things, we're not proposing to place limits on the number of permits that could be owned, and then the second difference is, we are not proposing the single ownership cap or banking, what I will parochially call bank it, trap banking. We viewed the banking provisions as a mitigation measure for the trap reductions.

Others were taking place between 2016 and 2021, and with trap reductions over, we saw the banking provisions as no longer necessary. One last thing I'll point out is, you know this measure or these proposed measures really put a pin in the fishery as it is today. It captures the fishery in its status quo state, so no major impacts were anticipated from this.

For Area 3 we have two interacting measures. I have tables on the next slide that kind of help show

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this a little bit better. But I wanted to walk through this, and give you a similar explanation as I did for Area 2. First, we're proposing to lower the maximum trap cap per vessel that can be the maximum number of traps that can be fished, from 1945 traps to 1548 traps over three years. This is a slight difference from the Addendum that recommended that reduction schedule over five years. Secondly, we're proposing an aggregate ownership cap. This relates to the maximum trap cap, but the ultimate cap after three years will be 7,740 traps per entity. Again, like with Area 2, those who are over that at final aggregate ownership cap, we're proposing to allow them to retain their traps, but not acquire additional traps.

Then next slide, I'll just summarize a few more things. The top table is what we proposed for measures for Area 3, and then the bottom table is a summary of what was recommended in the two Addenda. Again, I pointed out that this was recommended to take place over five years. You will note that the maximum aggregate permit cap is different between the two.

This is, I think, because the Addenda included banking provisions, and then allowed permit holders or entities to have five times the number of traps as the individual permit cap. We're trying to stay consistent with that thought by the Commission, and so we're proposing that entities can retain five times the maximum trap cap, because we're not proposing banking.

You'll see in the top table over three years the aggregate ownership cap will go down, consistent with the maximum trap cap reductions. I have a link in this presentation for how to comment. We welcome comments from the Commission, our state partners, the regulated and interested public.

That link will bring you right to this top page, and that little blue comment box brings you to another web page, where you can submit comments. I'm happy to take any questions on

this rulemaking. Oh, I should also point out that the deadline for submitting comments is next week, August 10th. Thank you, Mr. Chair.

CHAIR McNAMEE: Thanks for that, Alli. We have another opportunity for comment, potentially from the Commission if we wish. This one is pretty tight for the turnaround. Just given the time that we're at here, I'm looking over toward Toni or Bob, to see if this is another, if we can sort of follow the same procedure we followed with the last items. If there is something we can kind of get together offline. I'm just wondering if there is a mechanism. I don't think we're going to have time to gather comments here today.

MS. KERNS: I know we won't have time to gather comments here today. Caitlin, did you get any comments? Caitlin did ask for comments earlier in the week on this document, and we did not receive any. One, we received one. David Borden, I know that you had told me you were wanting to send us some comments, but I don't know if we got those in yet or not.

It will be hard for us to get a group together, because finding the time for that group will be difficult. We will try. But it might be that we need you to send Caitlin your comments no later than Friday, and then we can turn them around and put a letter together, and have the Lobster Board Chair and the Commission Chair and Vice-Chair review that letter.

If that is something that is acceptable to the Board. If there is anybody else that wants to see those comments at the same time as Jason, we can do that for those individuals. But having a lot of cooks in the kitchen editing the letter with this tight timeframe, will be difficult.

CHAIR McNAMEE: Thanks for that, Toni, okay. That seems like a good path forward, unless anyone disagrees around the table. David, yes, go ahead, David.

MR. BORDEN: I know you're trying to move this along. A couple of points. I've already talked to Alli,

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and she actually clarified some of the issues that I was concerned about. Before I forget it, I would like to complement both Alli and I think Chip had involvement with this. This is a proposal that the Commission made ten years ago to NOAA, and there has been a whole series of delays on this.

But finally, these two individuals have done their due diligence, and gotten it to us. The problem is that in the intervening period, the factual situation has really radically changed. When this was proposed, we only had one individual in the entire Area 3 group who was over the ownership cap. At this point we're in a situation where the Area 3 industry, 56 percent of the industry is owned by four companies.

These regulations, although really well intended and well designed by the industry when we first put them together, have really been superseded by the delays. These delays have allowed changes in the industry. I'm leading up to a question of Alli, I realize the timing issue. I think NOAA has to move forward really rapidly. That is one of the reasons they have such a short comment period.

Do we have the option, Alli, of for instance, approving this, but asking for a delay or an extension on the Area 2 and Area 3 component of it? In other words, in my own case, I have no objections to what NOAA has approved with the bulk of the changes that they've included. But I don't fully understand all of the nuances of those Area 2, Area 3 regulations. I would also point out quickly that there has been almost no industry feedback on this.

You couldn't pick a worse time to put out a proposed rule, because the offshore boats are fishing 10 days a week, 2 days onshore, and they are literally racing around loading boats, getting ready to go back out, and the inshore boats are doing the same thing, different schedule. Is it possible, Alli, for us to endorse the concept in what you proposed, but ask for an extension of the comment timeline on the

Area 2 and Area 3 component? If it is, I can make a suggestion, Mr. Chairman.

CHAIR McNAMEE: Response, Alli?

MS. MURPHY: Chip, if I get myself into trouble here, I'll look to you to bail me out from within the room. You know I think that, Mr. Borden, if that is a comment that you or the Commission wish to make, I think that is a perfectly reasonable comment, and we would consider that in the development of our Final Rule.

MR. BORDEN: Okay, so that is very helpful. I would suggest, Jason, to simplify the staff task, that we basically recommend approval of the proposed rule as it was written by NOAA, with the exception of the two parts on the Area 2, Area 3 regulations. In regard to those two sections, simply ask that they extend the comment period until the next meeting of the Commission, to allow us time to solicit input from the industry, and put together comments. I'm not making that as a motion, in the interest of time, but if you need a motion, I would be happy to do that.

CHAIR McNAMEE: We have a suggestion from David, does anybody have any comments around the table here about that? Dan.

MR. McKIERNAN: I would support David's suggestion for such a motion.

CHAIR McNAMEE: Toni.

MS. KERNS: You have Mike Pentony from NOAA Fisheries on the webinar with his hand up. I think we should hear from him.

CHAIR McNAMEE: We're going past 12:50 everyone. Go ahead, Mike, whenever you're ready.

MR. MICHAEL PENTONY: I'm just trying to get clarification on the intent, because I'm not clear on it. I think if there is going to be a motion or a request, it would be really good to be crystal clear on this. I think there are a couple of things that I heard. One was, approve the proposed rule as

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proposed, but extend the comment period on part of it.

Those are kind of contradictory. We could approve the rule, but delay implementation. We do that on occasion. You could request us to extend the comment period on the proposed rule before we make a decision to approve and implement it, or theoretically at least, we could, if this is your request. We could split the rule, and approve and implement one piece of it, and either disapprove or potentially.

I don't even know the mechanism by which we could do this. But it's something we could look at if this is your desire. Delay implementation or defer implementation or decision on the other part of the rule. Just because I want to be really clear what you're asking, so that we know how to respond and react. Thank you.

CHAIR McNAMEE: Toni, go ahead.

MS. KERNS: From my understanding in conversations with David, and you can correct me if I'm wrong. What we're looking for is to split the rule, because we understand the need for speed on the data collection portion, because we want that to happen for January 1. The Area 2, 3 cap measures are what we're trying to get additional time to provide a more thorough comment on.

CHAIR McNAMEE: Yes, that also makes sense to me. David, I think that is where you were trying to go there.

MR. BORDEN: Yes, that is exactly, Mr. Chairman, what Toni just said and what the Regional Administrator just said, is what my intent is, split the rule. We in essence approve it, let it go forward, but they split out those two parts, and take additional public comments on it, extend the comment deadline, which will give us the ability to get better comments from the industry, and talk to the industry about this. Thanks, Mike, for making that suggestion.

CHAIR McNAMEE: Yes, thanks for that, good discussions. Mike, does that make sense what was just kind of wrapped up there.

MR. PENTONY: Yes, thank you very much.

CHAIR McNAMEE: Okay, I think we have a plan. We have a plan, are there any objections to moving forward in that manner? Looking around the table for hands. Not seeing any. Any hands online? Go ahead, Alli.

MS. MURPHY: Thank you, Mr. Chair, I just abstained from any comments coming to NOAA Fisheries. Thanks.

CHAIR McNAMEE: All right, so we have two more items to go here. Thanks everybody for that, thank you, Alli, I appreciated that. Just trying to move us along here.

REVIEW AND POPULATE ADVISORY PANEL MEMBERSHIP

CHAIR McNAMEE: Moving on we've got an Advisory Panel topic here, and I'm hoping Tina is online. Tina, whenever you are ready, go ahead.

MS. TINA L. BERGER: I offer for the Board's consideration or approval three nominees to the American Lobster AP, and those are Chris Welch, commercial trapper from Maine, Todd Alger, a recreational diver from Massachusetts, and Eric Lorentzen, a commercial trapper from Massachusetts as well. You were provided their nomination forms in your main meeting materials.

CHAIR McNAMEE: Thank you, Tina, does anybody want to make that motion? Go ahead, Dan.

MR. McKIERNAN: **Yes, I'll make that motion.**

CHAIR McNAMEE: Motion made by Dan McKiernan, seconded by Pat Keliher. Anyone object to the motion, please raise your hand? Any hands online? **Okay, with no objections, the motion stands approved.** Thanks for that.

ELECTION OF VICE-CHAIR

Then the final item of business here is to elect a Vice-Chair. Does anybody wish to make a nomination? Dan McKiernan, go ahead.

MR. MCKIERNAN: Yes, I would like to nominate Maine Commissioner Pat Keliher as the Vice-Chair of the American Lobster Board.

CHAIR McNAMEE: Okay, nomination made by Dan McKiernan, seconded by Emerson Hasbrouck. Any objections, and you can't object, Pat. **Any objections to that nomination? Looking for hands around the table, any hands online. No objection, so that nomination stands approved, and congratulations, Pat.** I'm looking forward to you taking over this role.

ADJOURNMENT

CHAIR McNAMEE: That concludes the agenda, with the exception of Other Business. Is there any other business, I hope not, to come before the Board. Seeing no hands, we stand adjourned. Thanks everybody for hanging in.

(Whereupon the meeting adjourned at 12:55
p.m. on Tuesday, August 2, 2022)



Atlantic States Marine Fisheries Commission

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MEMORANDUM

TO: American Lobster Management Board
FROM: American Lobster Technical Committee
DATE: October 21, 2022
SUBJECT: 2022 American Lobster Data Update

Background

An annual Data Update process between American lobster stock assessments was recommended during the 2020 stock assessment to more closely monitor changes in stock abundance. The objective of this process is to present information—including any potentially concerning trends—that could support additional research or consideration of changes to management. Data sets updated during this process are generally those that indicate exploitable lobster stock abundance conditions expected in subsequent years and include:

- YOY settlement indicators
- Trawl survey indicators, including recruit abundance (71-80 mm carapace length lobsters) and survey encounter rate
- Ventless trap survey sex-specific abundance indices (53 mm+ carapace length lobsters)

This is the second Data Update and provides an update of last year’s review with the addition of 2021 data. Indicator status (negative, neutral, or positive – see table below) was determined relative to the percentiles of the stock assessment time series (i.e., data set start year through 2018).

Indicator	< 25 th percentile	Between 25 th and 75 th percentile	> 75 th percentile
YOY settlement (larval or YOY)	Negative	Neutral	Positive
Trawl survey recruit abundance	Negative	Neutral	Positive
Trawl survey encounter rate	Negative	Neutral	Positive
Ventless trap survey abundance	Negative	Neutral	Positive

The five-year means provided during the stock assessment (2014-2018) for terminal indicator status determinations were also updated with new years of data. This treatment of data is consistent with stock indicators provided during stock assessments (see Section 5 in the stock assessment report for more detail). As noted in last year’s Data Update memo, ventless trap survey abundance indices were added to indicators used in the stock assessment for this Data Update process. Note that updated five-year means (2017-2021) for several trawl survey-based indicators remain impacted by covid-19 data collection disruptions. A change that impacted this year’s update is a reduction in the spatial coverage of Massachusetts’ Southern New England (statistical area 538) ventless trap survey due to reduced participation. This change necessitates dropping out data collected during earlier years from areas no longer sampled to calculate an index from a consistent survey footprint, resulting in changes to the indices from what was reviewed last year. Note that the updated index increased slightly in scale (the

reduced footprint excludes most of the interior of Buzzards Bay), but the pattern over time is generally consistent with the previous index. Below are the results of the data updates by sub-stock.

Results

Gulf of Maine (GOM)

Overall, Gulf of Maine indicators show declines from time series highs observed during the stock assessment.

- YOY conditions showed improvements since the stock assessment, but were still not positive (Table 1 and Figure 1).
 - Updated five-year means were all neutral, indicating improvement since the stock assessment when two of the five-year means were negative (both southwest areas).
 - 2021 values moved from neutral to negative conditions in all three northeast areas, reversing some improvements seen in previous years. The two most southwest areas remained in neutral conditions observed in 2020.
- Trawl survey recruit abundance indicators generally remained positive, but showed some sign of decline since the stock assessment (Table 2 and Figure 2).
 - One of the updated five-year means changed from positive to neutral. The others remained positive.
 - 2021 values for three of four inshore indicators were neutral and the only available 2020 value was also neutral, the first observed neutral values since 2014 or 2015 for these indicators.
 - Five of six indicators were not available for 2020 due to covid-19 sampling restrictions.
- Trawl survey encounter rates show deteriorating conditions inshore since the stock assessment (Table 3 and Figure 3).
 - All four updated five-year means for inshore indicators were neutral, whereas only one was neutral during the stock assessment. Updated five-year means for the two offshore indicators remain positive.
 - Five of six indicators were not available for 2020 due to covid-19 sampling restrictions.
- Ventless trap survey indices show abundance declining since the stock assessment (Table 4 and Figure 4).
 - Seven of eight updated five-year means were neutral and one was negative, compared to four positive means and no negative means during the stock assessment.
 - Two additional values in 2021 moved into negative conditions.
 - 2021 values for both sexes in statistical area 514 were among the lowest values observed during the time series.

Georges Bank (GBK)

Overall, Georges Bank indicators show conditions similar to during the stock assessment. Note that there are no YOY or VTS indicators for this sub-stock area.

- Trawl survey recruit abundance indicators showed conditions similar to during the stock assessment (Table 5 and Figure 5).
 - Updated means for both indicators were neutral. This is unchanged from the stock assessment.
 - 2021 values were both positive and relatively high compared to other recent years.

- No indicators were available for 2020 due to covid-19 sampling restrictions.
- These indicators tend to be noisier than some of the other abundance indicators, with high interannual variability and lack of discernible trends.
- Trawl survey encounter rates showed declines in the fall since the stock assessment (Table 6 and Figure 6).
 - The updated mean for the fall indicator changed from positive to neutral, while the updated mean for the spring indicator remained positive.
 - No indicators were available for 2020 due to covid-19 sampling restrictions.

Southern New England (SNE)

Overall, Southern New England indicators show continued unfavorable conditions with some further signs of decline since the stock assessment.

- YOY conditions were negative across the stock with some decline since the stock assessment (Table 7 and Figure 7).
 - Updated five-year means were all negative, whereas one of three was neutral during the stock assessment.
 - Only one non-negative annual indicator has been observed since the stock assessment.
 - No YOY have been caught during the MA survey for the last seven years.
- Trawl survey recruit abundance indicators generally showed conditions similar to during the stock assessment with some slight decline offshore (Table 8 and Figure 8).
 - The updated five-year mean for the spring indicator offshore changed from neutral to negative. Other updated means were unchanged, with five inshore indicators remaining negative and the other two indicators (one inshore and one offshore) remaining neutral.
 - Six of eight indicators were not available for 2020 due to covid-19 sampling restrictions.
- Trawl survey encounter rates showed deteriorating conditions since the stock assessment (Table 9 and Figure 9).
 - Updated five-year means for all eight indicators were negative, with two changing from neutral to negative since the stock assessment.
 - 2021 values for all indicators were negative, the first year these uniform conditions have occurred during the time series.
 - Six of eight indicators were not available for 2020 due to covid-19 sampling restrictions.
- Ventless trap survey indices showed conditions similar to conditions during the stock assessment (Table 10 and Figure 10).
 - Updated five-year means were all neutral, unchanged from the stock assessment.
 - All annual values since the stock assessment have been negative in statistical area 539, but higher values observed in 2018 have kept the five-year means neutral.
 - The female index calculated with reduced survey area in statistical area 538 was similar to the index from the historical survey area reviewed last year. The 2018 and 2019 values for the male index changed from neutral for the historical survey area to negative for the reduced survey area.
 - It is important to note that the ventless trap survey has only taken place during depleted stock conditions coinciding with an adverse environmental regime, so interannual variability can be misleading without the context of a longer time series encompassing varying stock conditions.

Tables and Figures

Table 1. GOM abundance indicators: YOY indices.

YOUNG-OF-YEAR INDICES					
Survey	ME				MA
	511	512	513 East	513 West	514
1981					
1982					
1983					
1984					
1985					
1986					
1987					
1988					
1989			1.64		
1990			0.77		
1991			1.54		
1992			1.30		
1993			0.45		
1994			1.61		
1995		0.02	0.66		0.91
1996		0.05	0.47		
1997		0.05	0.46		0.10
1998		0.00	0.14		0.03
1999		0.04	0.65		0.43
2000	0.00	0.10	0.13	0.17	0.07
2001	0.24	0.43	2.08	1.17	0.39
2002	0.13	0.29	1.38	0.85	1.00
2003	0.22	0.27	1.75	1.22	0.75
2004	0.18	0.36	1.75	0.67	1.02
2005	1.42	1.25	2.40	1.12	1.06
2006	0.49	1.06	1.57	1.08	0.45
2007	0.59	1.11	2.23	1.30	1.27
2008	0.32	0.59	1.27	1.10	0.33
2009	0.66	0.33	1.51	0.48	0.17
2010	0.16	0.64	1.25	0.63	0.44
2011	0.41	0.98	2.33	0.90	0.58
2012	0.44	0.62	1.27	0.30	0.08
2013	0.10	0.20	0.48	0.12	0.00
2014	0.16	0.47	1.04	0.42	0.11
2015	0.15	0.22	0.42	0.03	0.00
2016	0.13	0.21	0.42	0.14	0.08
2017	0.21	0.36	0.65	0.23	0.08
2018	0.27	0.34	0.62	0.22	0.03
2014-2018 mean	0.18	0.32	0.63	0.21	0.06
2019	0.43	0.64	0.94	0.45	0.06
2020	0.29	0.51	1.06	0.33	0.19
2021	0.06	0.12	0.38	0.28	0.28
2017-2021 mean	0.25	0.39	0.73	0.30	0.13
25th median	0.15	0.18	0.51	0.23	0.08
75th	0.22	0.34	1.26	0.63	0.33
75th	0.42	0.60	1.60	1.09	0.67

Figure 1. GOM abundance indicators: YOY indices.

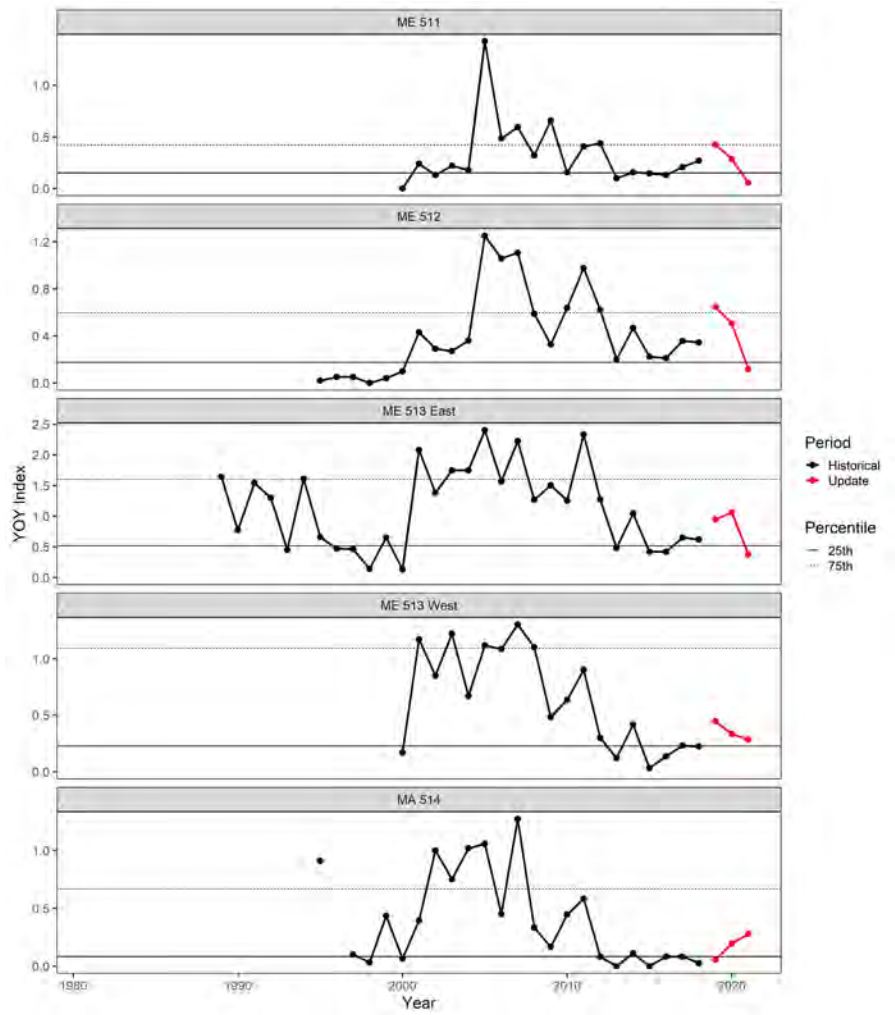


Table 2. GOM abundance indicators: trawl survey recruit abundance.

RECRUIT ABUNDANCE (SURVEY)						
Abundance of lobsters 71 - 80 mm CL (sexes combined)						
Survey	NEFSC		ME/NH		MA 514	
	Spring	Fall	Spring	Fall	Spring	Fall
1981	0.13	0.06			6.38	4.84
1982	0.29	0.42			2.74	3.85
1983	0.28	0.90			1.76	9.76
1984	0.20	0.31			2.15	6.13
1985	0.14	1.41			4.48	9.60
1986	0.27	1.29			3.01	3.80
1987	0.67	0.57			2.47	1.16
1988	0.67	1.21			2.52	4.12
1989	0.00	1.61			4.48	7.51
1990	0.27	1.76			6.11	15.36
1991	0.55	1.41			2.73	7.55
1992	0.50	1.37			4.31	8.95
1993	0.25	0.86			5.12	3.19
1994	0.15	2.75			7.59	13.77
1995	1.45	1.44			4.54	12.12
1996	0.76	4.59			3.09	12.10
1997	2.02	2.12			4.59	6.46
1998	1.59	2.16			4.50	7.47
1999	1.51	3.01			4.29	8.73
2000	4.64	3.01		24.09	4.24	8.87
2001	1.05	1.51	9.28	17.81	4.32	1.58
2002	1.08	1.91	22.00	22.41	3.43	5.00
2003	1.41	0.36	10.65	18.32	1.96	0.66
2004	0.84	2.26	7.55	12.29	2.46	1.30
2005	0.34	0.87	18.51	25.90	4.35	2.11
2006	2.17	1.27	18.07	18.30	6.09	5.30
2007	1.62	0.64	15.91	16.82	0.77	1.61
2008	0.99	2.41	17.88	31.61	2.54	6.12
2009	4.88	4.90	24.72	32.67	3.19	8.88
2010	2.98	4.53	17.66	37.35	2.22	9.39
2011	10.27	11.83	39.25	46.09	5.24	15.04
2012	11.25	6.74	36.55	37.12	3.03	11.30
2013	10.93	18.12	34.50	37.86	4.83	12.20
2014	11.66	21.54	65.07	41.95	3.35	7.06
2015	14.44	17.89	38.51	67.99	7.05	17.91
2016	13.25	22.54	50.83	60.07	13.61	17.44
2017	15.74		48.42	48.13	7.85	13.58
2018	14.15	15.87	42.77	55.84	5.25	25.69
2014-2018 mean	13.84	19.46	49.12	54.80	7.42	16.34
2019	16.69	7.62	46.37	50.85	10.69	14.59
2020				34.65		
2021	10.04	8.04	32.86	29.64	6.39	10.16
2017-2021 mean	14.15	10.51	42.61	43.82	7.55	16.01
25th median	0.30	1.21	17.72	20.37	2.73	4.30
75th	4.23	4.53	39.07	44.02	5.05	11.90

Figure 2. GOM abundance indicators: trawl survey recruit abundance.

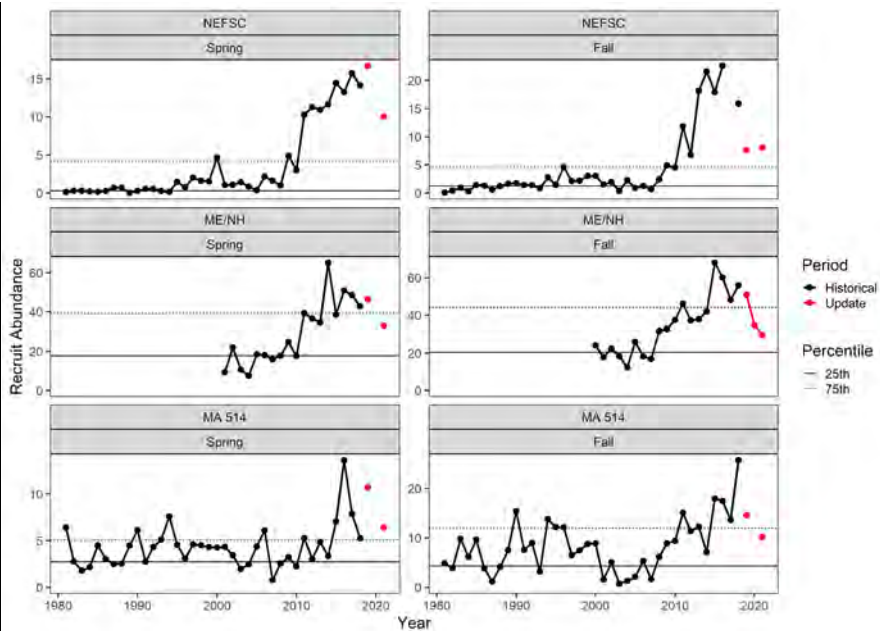


Table 3. GOM abundance indicators: trawl survey encounter rate.

SURVEY LOBSTER ENCOUNTER RATE						
Proportion of positive tows						
Survey	NEFSC		ME/NH		MA 514	
	Spring	Fall	Spring	Fall	Spring	Fall
1981	0.44	0.25			0.86	0.72
1982	0.34	0.18			0.50	0.70
1983	0.26	0.33			0.76	0.76
1984	0.28	0.36			0.76	0.76
1985	0.38	0.49			0.71	0.67
1986	0.33	0.47			0.68	0.83
1987	0.43	0.24			0.85	0.54
1988	0.31	0.30			0.76	0.58
1989	0.19	0.35			0.78	0.95
1990	0.41	0.32			0.86	0.95
1991	0.42	0.32			0.87	0.94
1992	0.40	0.24			0.93	0.77
1993	0.41	0.39			0.97	0.82
1994	0.45	0.40			1.00	0.93
1995	0.41	0.37			0.93	0.93
1996	0.54	0.54			0.91	0.95
1997	0.64	0.35			0.93	0.86
1998	0.52	0.40			0.76	0.69
1999	0.51	0.42			0.73	0.91
2000	0.63	0.42		0.94	0.93	0.98
2001	0.57	0.40	0.88	0.86	0.93	0.72
2002	0.75	0.53	0.94	0.95	0.91	0.73
2003	0.69	0.44	0.92	0.85	0.82	0.55
2004	0.87	0.31	0.89	0.86	0.84	0.56
2005	0.77	0.36	0.95	0.91	0.95	0.67
2006	0.72	0.60	0.93	0.93	0.91	0.88
2007	0.72	0.43	0.97	0.85	0.51	0.54
2008	0.84	0.49	0.92	0.86	0.83	0.75
2009	0.82	0.63	0.98	0.92	0.89	0.87
2010	0.85	0.75	0.98	0.96	0.87	0.98
2011	0.83	0.74	0.99	0.96	0.89	0.85
2012	0.86	0.78	0.98	0.98	0.91	0.95
2013	0.87	0.73	1.00	0.93	0.96	0.95
2014	0.90	0.71	1.00	0.99	0.79	0.96
2015	0.93	0.69	1.00	0.96	0.98	0.95
2016	0.94	0.75	1.00	0.96	0.96	0.97
2017	0.86		0.99	0.94	0.84	0.98
2018	0.86	0.71	0.98	0.96	0.84	0.90
2014-2018 mean	0.90	0.72	0.99	0.96	0.88	0.95
2019	0.83	0.71	0.99	0.95	0.85	0.92
2020				0.96		
2021	0.90	0.75	1.00	0.91	0.86	0.90
2017-2021 mean	0.86	0.72	0.99	0.94	0.85	0.93
25th median	0.41	0.35	0.93	0.89	0.78	0.72
75th	0.60	0.42	0.98	0.94	0.87	0.86
	0.84	0.60	0.99	0.96	0.93	0.95

Figure 3. GOM abundance indicators: trawl survey encounter rate.

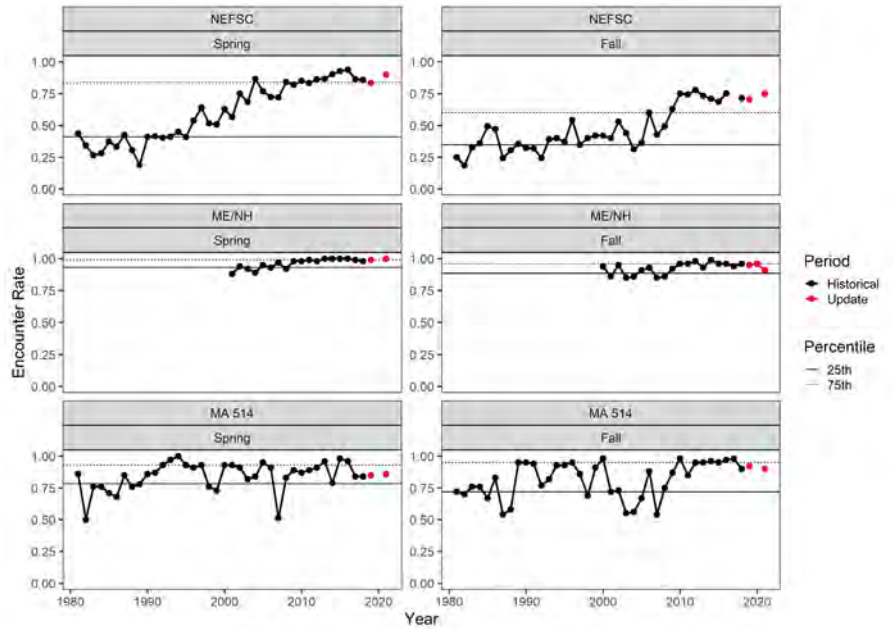


Table 4. GOM abundance indicators: ventless trap survey abundance.

VENTLESS TRAP ABUNDANCE								
Abundance of lobsters > 53 mm CL								
Survey	511		512		513		514	
	Female	Male	Female	Male	Female	Male	Female	Male
1981								
1982								
1983								
1984								
1985								
1986								
1987								
1988								
1989								
1990								
1991								
1992								
1993								
1994								
1995								
1996								
1997								
1998								
1999								
2000								
2001								
2002								
2003								
2004								
2005								
2006	7.65	5.34	6.87	5.38	5.73	4.37	3.10	3.40
2007	5.06	3.91	3.95	3.83	5.82	4.35	1.85	1.84
2008	4.94	3.87	5.78	4.95	5.78	4.97	2.77	2.51
2009	3.60	2.65	6.31	5.35	6.89	5.53	2.72	2.66
2010	5.66	3.90	6.95	5.69	6.61	5.27	2.49	2.22
2011	8.70	6.52	11.10	8.48	7.32	5.60	3.47	2.60
2012	10.95	7.64	12.06	9.47	11.40	7.72	5.21	4.52
2013	11.14	7.95	11.87	8.64	9.36	6.49		
2014	10.38	6.63	11.92	8.04	7.74	4.96	3.15	2.35
2015	8.47	4.63	10.39	7.70	8.54	5.48	4.01	3.16
2016	14.59	9.15	14.34	10.75	10.78	7.56	4.79	3.56
2017	11.69	7.07	11.61	8.52	8.46	5.56	3.38	2.45
2018	15.10	9.43	11.26	8.23	9.57	6.37	3.47	2.43
2014-2018 mean	12.05	7.38	11.90	8.65	9.02	5.99	3.76	2.79
2019	12.93	8.27	8.22	5.94	8.68	5.25	2.85	1.93
2020	7.66	5.47	7.91	5.96	9.29	6.61	2.50	1.69
2021	7.34	5.44	5.94	5.23	8.24	5.93	1.77	1.37
2017-2021 mean	10.94	7.14	8.99	6.78	8.85	5.94	2.80	1.97
25th median	5.66	3.91	6.87	5.38	6.61	4.97	2.76	2.41
75th	11.14	7.64	11.87	8.52	9.36	6.37	3.61	3.22

Figure 4. GOM abundance indicators: ventless trap survey abundance.

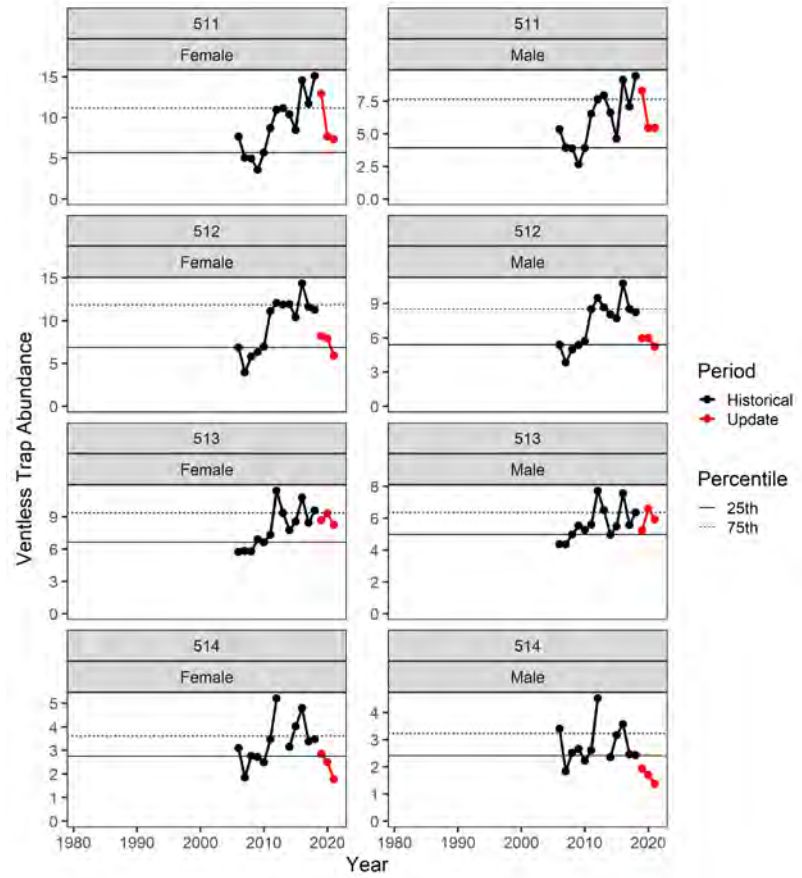


Table 5. GBK abundance indicators: trawl survey recruit abundance.

RECRUIT ABUNDANCE (SURVEY)		
Abundance of lobsters 71 - 80 mm CL (sexes combined)		
Survey	NEFSC	
	Spring	Fall
1981	0.08	0.28
1982	0.18	0.41
1983	0.16	0.33
1984	0.09	0.40
1985	0.19	0.26
1986	0.57	0.64
1987	0.43	0.54
1988	0.09	0.36
1989	0.04	0.23
1990	0.44	0.47
1991	0.08	0.34
1992	0.13	0.62
1993	0.50	0.22
1994	0.01	0.13
1995	0.03	0.14
1996	0.00	0.35
1997	0.06	0.90
1998	0.01	0.33
1999	0.07	0.29
2000	0.27	0.33
2001	0.47	0.45
2002	0.06	0.56
2003	0.29	0.16
2004	0.04	0.18
2005	0.09	0.13
2006	0.16	0.12
2007	0.03	0.23
2008	0.05	0.17
2009	0.30	0.33
2010	0.30	0.15
2011	0.09	0.35
2012	0.15	0.17
2013	0.14	0.24
2014	0.16	0.21
2015	0.06	0.44
2016	0.15	0.13
2017	0.35	
2018	0.04	0.22
2014-2018 mean	0.15	0.25
2019	0.16	0.13
2020		
2021	0.41	0.43
2017-2021 mean	0.24	0.26
25th median	0.06	0.18
	0.11	0.29
75th	0.25	0.40

Figure 5. GBK abundance indicators: trawl survey recruit abundance.

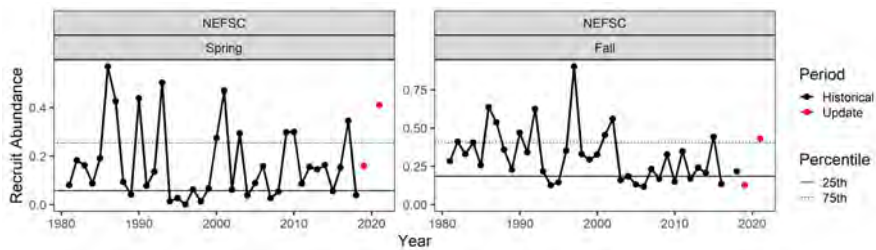


Table 6. GBK abundance indicators: trawl survey encounter rate.

SURVEY LOBSTER ENCOUNTER RATE		
Proportion of positive tows		
Survey	NEFSC	
	Spring	Fall
1981	0.23	0.52
1982	0.23	0.43
1983	0.18	0.38
1984	0.12	0.34
1985	0.19	0.35
1986	0.27	0.36
1987	0.18	0.35
1988	0.34	0.40
1989	0.14	0.38
1990	0.18	0.44
1991	0.19	0.45
1992	0.26	0.49
1993	0.22	0.36
1994	0.11	0.38
1995	0.14	0.42
1996	0.16	0.40
1997	0.10	0.48
1998	0.10	0.40
1999	0.16	0.58
2000	0.23	0.41
2001	0.23	0.49
2002	0.29	0.55
2003	0.27	0.44
2004	0.18	0.53
2005	0.16	0.58
2006	0.24	0.54
2007	0.26	0.46
2008	0.29	0.55
2009	0.34	0.54
2010	0.38	0.62
2011	0.30	0.69
2012	0.35	0.57
2013	0.33	0.65
2014	0.37	0.61
2015	0.27	0.59
2016	0.45	0.55
2017	0.40	0.55
2018	0.29	0.59
2014-2018 mean	0.36	0.58
2019	0.36	0.57
2020	0.41	0.48
2021	0.41	0.48
2017-2021 mean	0.37	0.54
25th median	0.18	0.40
75th	0.29	0.55

Figure 6. GBK abundance indicators: trawl survey encounter rate.

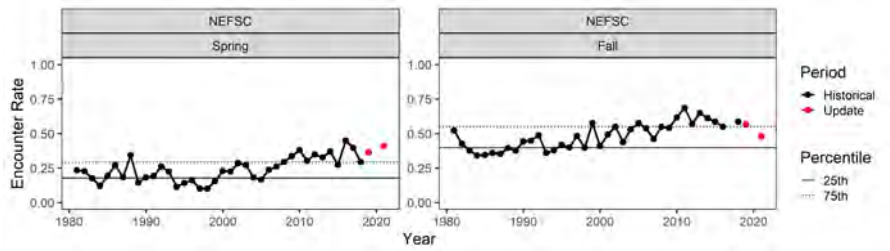


Table 7. SNE abundance indicators: YOY indices.

YOUNG-OF-YEAR INDICES			
Survey	MA	RI	CT / ELIS Larvae
1981			
1982			
1983			
1984			0.43
1985			0.53
1986			0.90
1987			0.78
1988			0.74
1989			0.74
1990		1.18	0.81
1991		1.51	0.55
1992		0.63	1.44
1993		0.51	1.19
1994		1.27	0.98
1995	0.17	0.34	1.46
1996	0.00	0.15	0.31
1997	0.08	0.98	0.21
1998	0.28	0.57	0.55
1999	0.06	1.03	2.83
2000	0.33	0.33	0.78
2001	0.11	0.75	0.32
2002	0.11	0.25	0.64
2003	0.00	0.73	0.25
2004	0.06	0.42	0.45
2005	0.17	0.54	0.49
2006	0.22	0.44	0.71
2007	0.17	0.36	0.37
2008	0.00	0.14	0.37
2009	0.06	0.06	0.19
2010	0.00	0.11	0.35
2011	0.00	0.00	0.26
2012	0.00	0.09	0.12
2013	0.17	0.19	0.16
2014	0.11	0.22	0.06
2015	0.00	0.17	0.19
2016	0.00	0.06	0.45
2017	0.00	0.03	0.10
2018	0.00	0.03	0.17
2014-2018 mean	0.02	0.10	0.19
2019	0.00	0.03	0.21
2020	0.00	0.14	0.10
2021	0.00	0.08	0.19
2017-2021 mean	0.00	0.06	0.15
25th	0.00	0.14	0.26
median	0.06	0.34	0.45
75th	0.17	0.63	0.76

Figure 7. SNE abundance indicators: YOY indices.

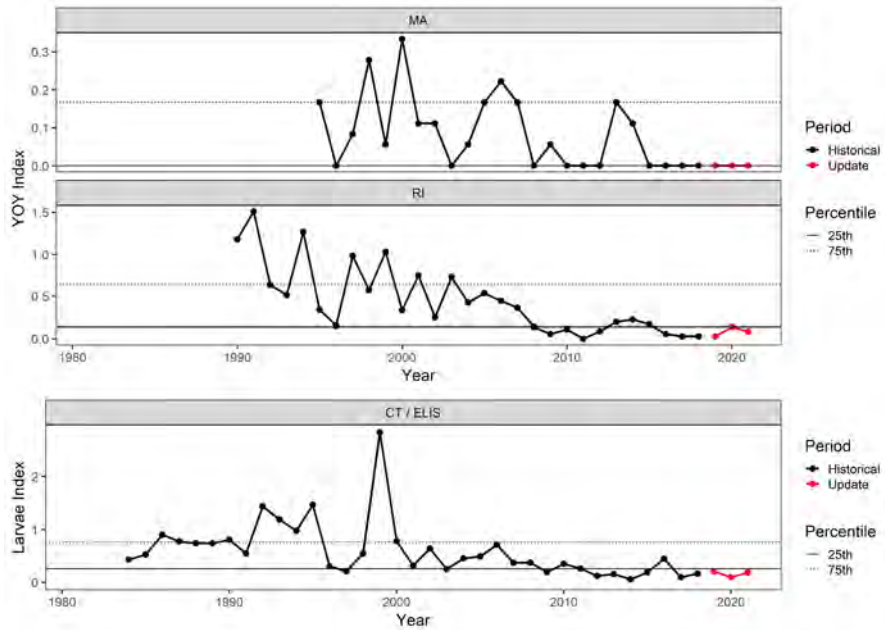


Table 8. SNE abundance indicators: trawl survey recruit abundance.

RECRUIT ABUNDANCE (SURVEY)								
Abundance of lobsters 71 - 80 mm CL (sexes combined)								
Survey	NEFSC		MA		RI		CT	
	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall
1981	0.10	0.89	0.65	0.07	0.89	1.31		
1982	0.74	0.74	0.10	0.04	0.26	0.64		
1983	0.45	0.62	0.09	0.04	0.94	0.43		
1984	0.10	0.81	0.42	0.01	1.03	1.35	10.09	6.80
1985	1.99	1.01	0.34	0.09	0.28	0.97	3.08	3.93
1986	0.18	0.59	0.17	0.20	0.91	1.28	2.77	5.76
1987	1.04	0.45	0.26	0.17	0.79	3.14	2.93	6.86
1988	0.55	0.60	0.24	0.16	0.47	4.05	1.85	4.88
1989	0.09	1.65	0.14	0.43	0.90	3.26	4.86	5.28
1990	0.71	0.83	2.29	0.31	2.17	2.69	6.89	7.74
1991	0.31	0.51	1.18	0.87	4.77	3.10	10.83	10.32
1992	0.19	0.94	0.10	0.57	0.62	1.97	10.31	10.65
1993	0.59	0.42	0.25	0.52	7.81	8.29	7.78	15.18
1994	0.15	0.38	0.95	0.42	1.00	3.88	5.07	11.51
1995	0.01	0.61	1.14	0.03	1.33	4.50	12.13	11.20
1996	0.40	2.39	0.40	0.32	1.60	6.55	13.37	11.08
1997	1.64	1.60	1.45	0.12	2.58	6.10	15.42	24.99
1998	0.78	1.06	1.09	0.11	1.63	3.24	24.06	12.72
1999	2.43	0.66	0.75	0.19	1.71	2.07	24.57	12.96
2000	0.67	1.27	0.56	0.13	1.54	1.83	13.37	8.27
2001	0.39	0.45	0.18	0.03	2.97	2.17	10.77	7.41
2002	1.63	0.39	0.34	0.00	2.68	0.73	8.07	2.75
2003	0.34	0.33	0.07	0.00	0.29	0.93	3.52	4.08
2004	0.27	0.28	0.05	0.00	1.86	1.48	2.38	3.37
2005	0.11	0.24	0.08	0.00	1.07	2.53	2.26	1.54
2006	0.19	0.32	0.08	0.03	3.63	2.24	2.02	1.38
2007	0.19	0.35	0.08	0.00	0.68	2.68	2.65	1.12
2008	0.21	0.29	0.16	0.01	0.64	2.95	2.20	1.27
2009	0.15	0.35	0.16	0.05	1.14	1.36	1.20	1.33
2010	0.21	0.73	0.06	0.18	0.44	1.21	1.26	
2011	0.10	0.64	0.18	0.00	0.42	1.02	0.43	0.18
2012	0.11	0.99	0.07	0.21	0.30	0.18	0.44	0.08
2013	0.23	0.44	0.11	0.04	0.16	0.02	0.23	0.06
2014		0.67	0.04	0.00	0.02	0.14	0.15	0.05
2015	0.03	0.28	0.07	0.30	0.05	0.37	0.15	0.06
2016	0.83	0.69	0.05	0.14	0.57	0.25	0.16	0.00
2017	0.10		0.13	0.16	0.14	0.41	0.03	0.00
2018	0.08	0.38	0.02	0.01	0.18	0.68	0.00	0.01
2014-2018 mean	0.26	0.51	0.06	0.12	0.19	0.37	0.10	0.03
2019	0.06	0.32	0.01	0.02	0.52	0.50	0.03	0.00
2020					0.23	0.32		
2021	0.01	0.59	0.01	0.00	0.27	0.07	0.03	0.00
2017-2021 mean	0.06	0.43	0.04	0.05	0.27	0.40	0.02	0.00
25th median	0.11	0.38	0.08	0.02	0.42	0.78	1.23	1.16
75th	0.23	0.61	0.17	0.10	0.91	1.65	2.93	4.48
	0.67	0.83	0.42	0.20	1.62	3.07	10.20	9.81

Figure 8. SNE abundance indicators: trawl survey recruit abundance.

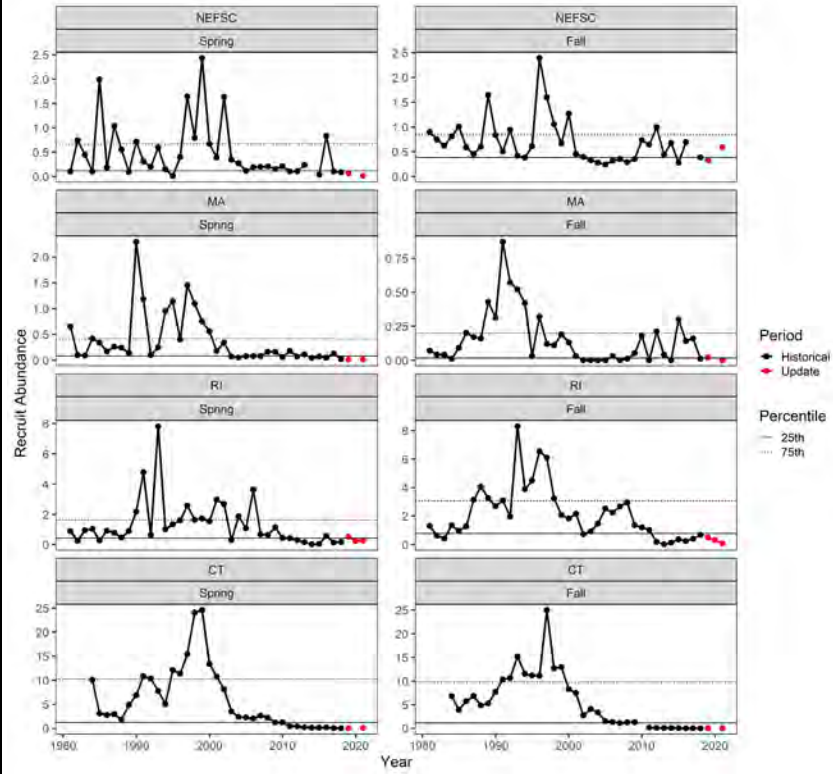


Table 9. SNE abundance indicators: trawl survey encounter rate.

SURVEY LOBSTER ENCOUNTER RATE								
Proportion of postive tows								
Survey	NEFSC		MA		RI		CT	
	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall
1981	0.18	0.47	0.38	0.15	0.49	0.41		
1982	0.26	0.35	0.28	0.21	0.30	0.43		
1983	0.14	0.26	0.21	0.16	0.46	0.37		
1984	0.08	0.32	0.40	0.18	0.59	0.44	0.63	0.76
1985	0.21	0.34	0.51	0.22	0.31	0.50	0.57	0.69
1986	0.17	0.25	0.39	0.38	0.64	0.46	0.67	0.61
1987	0.13	0.23	0.28	0.18	0.35	0.47	0.63	0.76
1988	0.09	0.28	0.39	0.21	0.49	0.55	0.65	0.66
1989	0.13	0.40	0.50	0.33	0.52	0.57	0.75	0.63
1990	0.14	0.44	0.66	0.44	0.64	0.53	0.73	0.76
1991	0.14	0.33	0.41	0.39	0.77	0.69	0.81	0.77
1992	0.22	0.34	0.51	0.23	0.40	0.57	0.77	0.68
1993	0.12	0.27	0.54	0.26	0.50	0.71	0.73	0.75
1994	0.09	0.25	0.51	0.20	0.58	0.57	0.73	0.74
1995	0.05	0.35	0.44	0.12	0.55	0.67	0.77	0.68
1996	0.10	0.39	0.30	0.16	0.79	0.76	0.66	0.78
1997	0.25	0.28	0.45	0.21	0.75	0.71	0.71	0.81
1998	0.12	0.34	0.54	0.13	0.59	0.55	0.83	0.71
1999	0.22	0.28	0.41	0.21	0.76	0.59	0.78	0.79
2000	0.13	0.31	0.45	0.15	0.68	0.63	0.81	0.73
2001	0.21	0.25	0.28	0.18	0.65	0.60	0.77	0.58
2002	0.19	0.24	0.28	0.03	0.61	0.45	0.73	0.59
2003	0.11	0.26	0.14	0.03	0.51	0.40	0.71	0.64
2004	0.10	0.19	0.28	0.03	0.54	0.50	0.61	0.66
2005	0.08	0.19	0.34	0.15	0.49	0.45	0.63	0.54
2006	0.14	0.23	0.42	0.03	0.79	0.62	0.61	0.51
2007	0.13	0.21	0.34	0.10	0.44	0.54	0.70	0.53
2008	0.10	0.22	0.32	0.10	0.55	0.52	0.63	0.65
2009	0.17	0.32	0.50	0.05	0.57	0.40	0.49	0.55
2010	0.12	0.33	0.22	0.24	0.47	0.45	0.54	
2011	0.13	0.35	0.17	0.05	0.30	0.23	0.46	0.28
2012	0.13	0.34	0.17	0.15	0.27	0.16	0.43	0.20
2013	0.10	0.28	0.18	0.08	0.20	0.09	0.28	0.15
2014		0.26	0.13	0.08	0.07	0.23	0.26	0.10
2015	0.06	0.27	0.10	0.05	0.12	0.16	0.27	0.10
2016	0.15	0.25	0.08	0.11	0.30	0.14	0.25	0.03
2017	0.08		0.07	0.16	0.16	0.23	0.08	0.03
2018	0.08	0.29	0.11	0.06	0.09	0.18	0.09	0.01
2014-2018 mean	0.09	0.27	0.10	0.09	0.15	0.19	0.19	0.05
2019	0.05	0.26	0.05	0.11	0.16	0.11	0.09	0.00
2020					0.16	0.16		
2021	0.04	0.18	0.07	0.00	0.20	0.12	0.06	0.03
2017-2021 mean	0.06	0.24	0.08	0.08	0.15	0.16	0.08	0.02
25th median	0.10	0.25	0.21	0.09	0.32	0.40	0.52	0.52
75th	0.13	0.28	0.34	0.16	0.51	0.49	0.65	0.64
	0.17	0.34	0.45	0.21	0.60	0.57	0.73	0.74

Figure 9. SNE abundance indicators: trawl survey encounter rate.

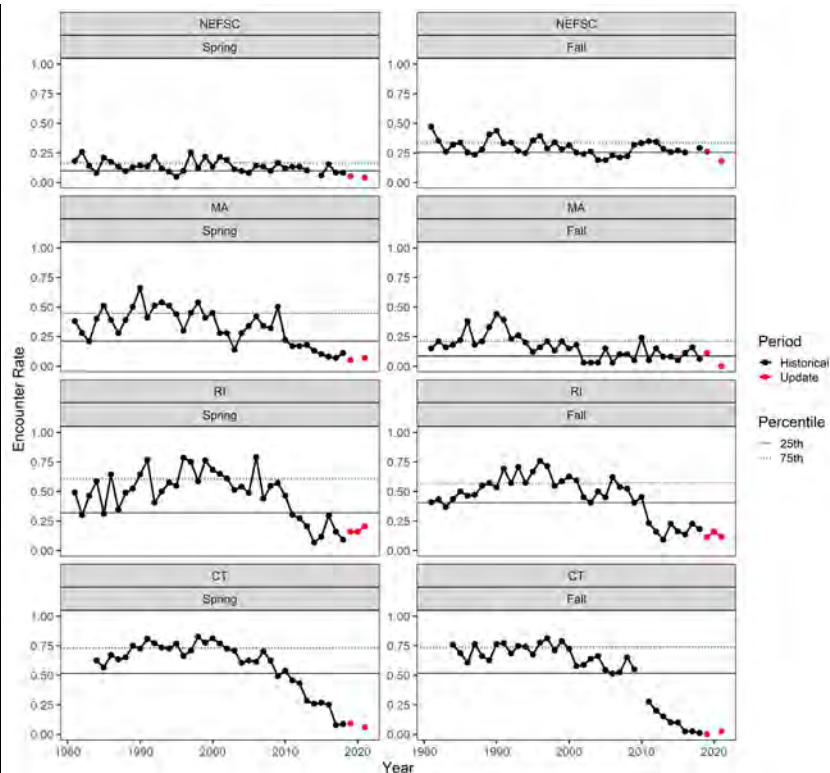
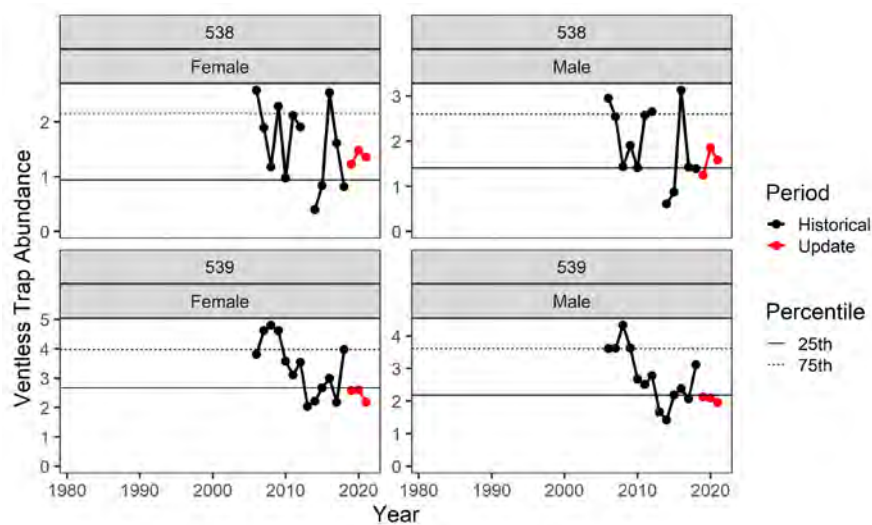


Table 10. SNE abundance indicators: ventless trap survey abundance.

VENTLESS TRAP ABUNDANCE				
Abundance of lobsters ≥ 53 mm CL				
Survey	538		539	
	Female	Male	Female	Male
1981				
1982				
1983				
1984				
1985				
1986				
1987				
1988				
1989				
1990				
1991				
1992				
1993				
1994				
1995				
1996				
1997				
1998				
1999				
2000				
2001				
2002				
2003				
2004				
2005				
2006	2.58	2.95	3.81	3.60
2007	1.89	2.54	4.61	3.61
2008	1.18	1.43	4.80	4.32
2009	2.29	1.90	4.61	3.62
2010	0.97	1.41	3.57	2.67
2011	2.12	2.58	3.11	2.50
2012	1.90	2.65	3.53	2.77
2013			2.03	1.67
2014	0.40	0.61	2.22	1.42
2015	0.84	0.87	2.66	2.18
2016	2.53	3.13	2.99	2.38
2017	1.61	1.43	2.17	2.06
2018	0.82	1.39	3.97	3.12
2014-2018 mean	1.24	1.48	2.80	2.23
2019	1.23	1.25	2.57	2.12
2020	1.47	1.85	2.60	2.10
2021	1.36	1.58	2.19	1.95
2017-2021 mean	1.30	1.50	2.70	2.27
25th median	0.94	1.40	2.66	2.18
75th	2.16	2.60	3.97	3.60

Figure 10. SNE abundance indicators: ventless trap survey abundance.



Atlantic States Marine Fisheries Commission

**DRAFT ADDENDUM XXVII TO AMENDMENT 3 TO THE AMERICAN
LOBSTER FISHERY MANAGEMENT PLAN FOR PUBLIC COMMENT**

***Increasing Protection of Spawning Stock in the Gulf of Maine/Georges
Bank***



January 2022



Sustainable and Cooperative Management of Atlantic Coastal Fisheries

American Lobster Draft Addendum XXVII for Public Comment

Public Comment Process and Proposed Timeline

In August 2017, the American Lobster Management Board (Board) initiated Draft Addendum XXVII to increase the resiliency of the Gulf of Maine/Georges Bank (GOM/GBK) stock. Work on this addendum was paused due to the prioritization of work on take reduction efforts for Atlantic right whales. The Board reinitiated work on Draft Addendum XXVII in February 2021, and has since revised the goal of the addendum to consider a trigger mechanism such that, upon reaching the trigger, measures would be automatically implemented to increase the overall protection of spawning stock biomass of the GOM/GBK stock. This management action was initially in response to signs of reduced settlement and the combining of the GOM and GBK stocks following the 2015 Stock Assessment, and more recently in response to a continuation of those trends observed in the 2020 Stock Assessment. This document presents background on the Atlantic States Marine Fisheries Commission's management of lobster, the addendum process and timeline, a statement of the problem, and management measures for public consideration and comment.

The public is encouraged to submit comments regarding the proposed management options in this document at any time during the addendum process. The final date comments will be accepted is **Month, Day 2022 at 5:00 p.m. EST**. Comments may be submitted by mail, email, or fax. If you have any questions or would like to submit comments, please use the contact information below.

Mail: Caitlin Starks

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Arlington, VA 22201
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Implementation of Addendum XXVII Provisions

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1.0 Introduction

The Atlantic States Marine Fisheries Commission (ASMFC) has coordinated the interstate management of American lobster (*Homarus americanus*) from 0-3 miles offshore since 1996. American lobster is currently managed under Amendment 3 and Addenda I-XXVI to the Fishery Management Plan (FMP). Management authority in the Exclusive Economic Zone (EEZ) from 3-200 miles from shore lies with NOAA Fisheries. The management unit includes all coastal migratory stocks between Maine and Virginia. Within the management unit there are two lobster stocks and seven management areas. The Gulf of Maine/Georges Bank (GOM/GBK) stock (subject of this draft addendum) is primarily comprised of three Lobster Conservation Management Areas (LCMAs), including LCMA 1, 3, and Outer Cape Cod (OCC) (Figure 1). There are three states (Maine through Massachusetts) which regulate American lobster in state waters of the GOM/GBK stock; however, landings from the GOM/GBK stock occur from Rhode Island through New York and these states regulate the landings of lobster in state ports.

The Board initiated Draft Addendum XXVII as a proactive measure to protect the GOM/GBK spawning stock. Since the early 2000's, landings in the GOM/GBK stock have exponentially increased. In Maine alone, landings have increased three-fold from 57 million pounds in 2000 to a record high of 132 million pounds in 2016. Maine landings have declined slightly but were still near time-series highs at 101.8 million and 96.6 million in 2019 and 2020, respectively. However, since 2012, lobster settlement surveys throughout the GOM have generally been below the time series averages in all areas. These surveys, which measure trends in the abundance of newly-settled and juvenile lobster, can be used to track populations and forecast future landings. Consequently, persistent lower densities of settlement could foreshadow decline in recruitment and landings. In the most recent years of the time series, declines in recruit indices have already been observed.

Given the American lobster fishery is one of the largest and most valuable fisheries along the Atlantic coast, potential decreases in abundance and landings could result in vast economic and social consequences. In 2016, the at-the-dock value of the American lobster fishery peaked at \$670.4 million dollars, representing the highest ex-vessel value of any species landed along the Atlantic coast that year. Ex-vessel value has since declined slightly but not proportionally to declines in landings. The vast majority of the overall landings value (>90%) comes from the GOM/GBK stock, and more specifically from the states of Maine through Rhode Island. As a result, the lobster fishery is an important source of jobs (catch, dock side commerce, tourism, etc.) and income for many New England coastal communities. The lack of other economic opportunities, both in terms of species to fish and employment outside the fishing industry, compounds the economic reliance of some coastal communities on GOM/GBK lobster – particularly in Maine.

Draft Addendum XXVII responds to signs of reduced settlement and the combination of the GOM and GBK stocks following the 2015 Stock Assessment and the continuation of reduced settlement observed in the 2020 Stock Assessment. The Board specified the following objective statement for Draft Addendum XXVII:

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Given persistent low settlement indices and recent decreases in recruit indices, the addendum should consider a trigger mechanism such that, upon reaching the trigger, measures would be automatically implemented to increase the overall protection of spawning stock biomass of the GOM/GBK stock.

Draft Addendum XXVII considers implementing management measures—specifically gauge and vent sizes—that are expected to add an additional biological buffer through the protection of spawning stock biomass (SSB). The addendum also considers immediate action upon final approval to standardize some management measures within and across LCMAs in the GOM/GBK stock. The purpose of considering more consistency in measures is to resolve discrepancies between the regulations for state and federal permit-holders, to provide a consistent conservation strategy, and simplify enforcement across management areas and interstate commerce.

2.0 Overview

2.1 Statement of Problem

While 2016 landings in the GOM/GBK lobster fishery were the highest on record, settlement surveys over the past five years have consistently been below the 75th percentile of their time series, indicating neutral or poor conditions. Additionally, there is evidence of declines in recruit abundance in ventless trap survey and trawl surveys for the GOM/GBK stock since the most recent stock assessment. These declines could indicate future declines in recruitment and landings. Given the economic importance of the lobster fishery to many coastal communities in New England, especially in Maine, potential reductions in landings could have vast socioeconomic impacts. In addition, the 2015 Stock Assessment combined the GOM and GBK stocks into a single biological unit due to evidence of migration between the two regions. As a result, there are now varying management measures within a single biological stock. In response to these two issues, the Board initiated Draft Addendum XXVII to consider the standardization of management measures across LCMAs.

However, in 2021, the Board revised the focus of Addendum XXVII to prioritize increasing biological resiliency of the stock over standardization of management measures across LCMAs. Increased resiliency may be achieved without completely uniform management measures, so the main objective of the Addendum is to increase the overall protection of SSB while also considering management options that are more consistent than status quo. Increasing consistency across management areas may help to address some assessment and enforcement challenges, as well as concerns regarding the shipment and sale of lobsters across state lines.

2.2 Status of the GOM/GBK Fishery

The GOM/GBK fishery has experienced incredible growth over the last two decades. Throughout the 1980s, GOM/GBK landings averaged 35 million pounds, with 91% of landings coming from the GOM portion of the stock. In the 1990s, landings slightly increased to an average of 53 million pounds; however, landings started to rapidly increase in the mid-2000s. Over a one year span (2003-2004), landings increased by roughly 18 million pounds to 86 million pounds. This growth continued through the 2000s with 97 million pounds landed in

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2009 and 113 million pounds landed in 2010. Landings continued to increase and peaked at 156 million pounds in 2016 (Figure 2).

In the peak year of 2016, Maine alone landed 132.7 million pounds, representing an ex-vessel value of over \$541 million. The states of Maine through Rhode Island (the four states that account for the vast majority of harvest from the GOM/GBK stock), landed 158 million pounds in 2016, representing 99% of landings coastwide. Total ex-vessel value of the American lobster fishery in 2016 was \$670.4 million, the highest value recorded for the fishery and the highest valued fishery along the Atlantic coast in 2016. While landings and ex-vessel value have both declined slightly from peak levels in 2016, they remain near all-time highs. Coastwide landings and ex-vessel value for 2017-2020 averaged 133.2 million pounds and \$591.5 million, respectively.

2.3 Status of the GOM/GBK Stock

2.3.1 2020 Stock Assessment

Results of the 2020 Benchmark Stock Assessment indicate a dramatic overall increase in the abundance of lobsters in the GOM/GBK stock since the late 1980s. After 2008, the rate of increase accelerated, and the stock reached a record high abundance level in 2018. Based on a new analysis to identify shifts in the stock that may be attributed to changing environmental conditions and new baselines for stock productivity, the GOM/GBK stock shifted from a low abundance regime during the early 1980s through 1995 to a moderate abundance regime during 1996-2008, and shifted once again to a high abundance regime during 2009-2018 (Figure 3). Spawning stock abundance and recruitment in the terminal year of the assessment (2018) were near record highs. Exploitation (proportion of stock abundance removed by the fishery) declined in the late 1980s and has remained relatively stable since.

Based on the new abundance reference points adopted by the Board, the GOM/GBK stock is in favorable condition. The average abundance from 2016-2018 was 256 million lobsters, which is greater than the fishery/industry target of 212 million lobsters. The average exploitation from 2016-2018 was 0.459, below the exploitation target of 0.461. Therefore the GOM/GBK lobster stock is not depleted and overfishing is not occurring.

Stock indicators based on observed data were also used as an independent, model-free assessment of the lobster stocks. These indicators included exploitation rates as an indicator of mortality; young-of-year (YOY), fishery recruitment, SSB, and encounter rates as indicators of abundance, and total landings, effort, catch per unit effort, and monetary measures as fishery performance indicators. Additionally, annual days with average water temperatures $>20^{\circ}\text{C}$ at several temperature monitoring stations and the prevalence of epizootic shell disease in the population were added as indicators of environmental stress. The 20°C threshold is a well-documented threshold for physiological stress in lobsters. Epizootic shell disease is considered a physical manifestation of stress that can lead to mortality and sub-lethal health effects.

While the stock assessment model and model-free indicators supported a favorable picture of exploitable stock health during the recent 2020 Stock Assessment, the assessment conversely

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noted YOY indices did not reflect favorable conditions in recent years and indicate potential for decline in recruitment to the exploitable stock in future years (Table 1). Specifically, YOY indices in two of five regions were below the 25th percentile of the time series (indicating negative conditions) in the terminal year of the assessment (2018) and when averaged over the last five years (2014-2018); the remaining three regions were below the 75th percentile (indicating neutral conditions).

Mortality indicators generally declined through time to their lowest levels in recent years. Fishery performance indicators were generally positive in recent years with several shifting into positive conditions around 2010. Stress indicators show relatively low stress, but indicate some increasingly stressful environmental conditions through time, particularly in the southwest portion of the stock.

As recommended in the 2020 stock assessment, a data update process will occur annually to update American lobster stock indicators, including YOY settlement indicators, trawl survey indicators, and ventless trap survey indices. The first annual data update was completed in 2021 and the results are provided in Appendix A.

2.3.2 YOY Surveys

Since the terminal year of the assessment (2018), YOY indices have continued to show unfavorable conditions in the GOM/GBK stock. There have been sustained low levels of settlement observed from 2012 through the assessment and in the time period since the assessment terminal year in 2018. In Maine, 2019 and 2020 YOY indices were below the 75th percentile of their time series throughout all statistical areas sampled. In New Hampshire, sustained low levels of settlement have been seen from 2012 through 2020. In Massachusetts, the 2019 index was below the 25th percentile of its time series and rebounded slightly in 2020, but remained well below the 75th percentile.

Sustained and unfavorable YOY indices are concerning as they could foreshadow poor future year classes in the lobster fishery. Lobster growth is partially temperature-dependent and it is expected that it takes seven to nine years for a lobster to reach commercial size. Thus, decreased abundance of YOY lobsters today could foreshadow decreased numbers of lobsters available to the fishery in the future. Given there have been eight consecutive years of low YOY indices in the GOM, this trend may soon be reflected in the GOM/GBK stock. What is more concerning is that declines in the Southern New England (SNE) stock, which is currently at record low abundance, began with declines in YOY indices. Specifically, SNE YOY indices began to decline in 1995, two years before landings peaked in 1997, and roughly five years before landings precipitously declined in the early 2000's.

There are several hypotheses as to why the YOY indices have been low and what this could mean for the future of the GOM/GBK stock. One hypothesis is that declines in the YOY indices are reflecting a true decline in the newly-settled portion of the stock, and are related to declining food resources (specifically zooplankton). Carloni et al. (2018) examined trends in lobster larvae to explore linkages between SSB and YOY abundance. The study found a

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significant increasing trend in stage I larval abundance consistent with the increases in SSB in the GOM. Planktonic postlarvae on the other hand, had a declining trend in abundance similar to trends for YOY settlement throughout western GOM. The study also found significant correlations between lobster postlarvae and the copepod *C. finmarchicus*, but there were no relationships with other zooplankton. This suggests recruitment processes in the GOM could be linked to larval food supply.

Declines in the YOY indices could also be an artifact of the lobster population moving further offshore. Recent work suggests warming in the GOM on the scale of decades has expanded thermally suitable habitat areas and played a significant role in the increase of observed settlement into deeper areas, particularly in the Eastern Gulf of Maine (Goode et al. 2019), so lobster settlement may be diluted across a greater area. Given the YOY surveys typically occur inshore, the surveys may be unable to account for increased abundance of YOY lobsters farther offshore. In an effort to test this theory, the TC looked at potential increases in the habitat available for recruitment in the GOM/GBK stock due to warming waters. Specifically, the TC calculated the quantity of habitat by depth in the GOM. Results showed that incremental increases in depth result in incremental increases in recruitment habitat and small observed decreases in recruit densities in shallow waters; there is no evidence that incremental increases in depth result in exponential increases in available habitat. In order for the diffusion of YOY lobsters over a larger area to completely explain the observed decreases in the YOY indices, the habitat available to recruitment would have to more than double. This suggests dilution effects from increased habitat availability alone are not sufficient to explain decreases in the YOY indices, and there are likely other changes occurring in the system.

2.3.3 Ventless Trap Surveys and Trawl Surveys

While YOY surveys have detected declines in the number of newly settled lobsters, results of the ventless trap survey (VTS) and trawl surveys, which encounter larger sized lobsters just before they recruit to the fishery, have only exhibited evidence of potential decline in the most recent years and interpretation of these trends are complicated by sampling restrictions and limited surveys in 2020 resulting from the COVID-19 pandemic. VTS indices show declines since peaking in 2016, especially in the eastern regions. The ME/NH Fall Trawl Survey, which was the only trawl survey to sample in 2020, showed a decline in recruit lobster abundance, while 2019 indices for other trawl surveys remained at high levels and were above the previous year for spring surveys but consistently below the 2018 levels for the fall surveys.

It is important to continue to closely monitor these surveys as marked decreases in the VTS and/or trawl surveys would confirm the declines seen in the YOY surveys.

2.4 Economic Importance of the American Lobster Fishery

Much of the concern regarding the declines in the lobster indices result from the vast economic importance of the lobster fishery to much of the GOM. For the states of Maine through Massachusetts, lobster is one of the most valuable fisheries and the large majority of landings come from the GOM/GBK stock.

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For Maine, American lobster is an essential economic driver for the coastal economy. Lobster annually represents more than 75% of Maine’s marine resource landings by ex-vessel value (79% in 2020). The landings and value peaked in 2016 with more than 132 million pounds harvested and provided more than \$540 million dollars in ex-vessel value¹. The lobster harvester sector includes more than 5,770 license holders of which 4,200 are active license holders who complete more than 270,000 trips a year selling to 240 active lobster dealers (Maine DMR, unpublished data). The lobster distribution supply chain contributes an additional economic impact of \$1 billion annually (“Lobster to Dollars”, 2018). Not included in these numbers are the vessel crew members and other associated businesses (bait vessels and dealers, boat builders, trap builders, and marine supply stores) that are essential in delivering lobsters to consumers worldwide, supporting the industry, and driving Maine’s coastal communities.

The American lobster fishery is the most valuable commercial fishery in New Hampshire with an ex-vessel value of over \$35 million in 2019, the last year prior to the economic impacts of the COVID-19 pandemic, and over \$25 million in 2020. The value of lobster landed accounted for over 94% of the value of all commercial species landed in New Hampshire. The lobster fishery in New Hampshire includes over 300 licensed commercial harvesters, over 200 of which are active, who sold to more than 30 licensed lobster dealers (Renee Zobel, personal communication). The importance of the economic impact of the lobster fishery to New Hampshire is also seen in the over 450 businesses licensed to sell lobster to consumers at the retail level.

For Massachusetts, American lobster is the second most valuable fishery in terms of overall landings value, and the most valuable of all fisheries conducted within Massachusetts state waters. The total estimated value for annual lobster landings in Massachusetts has been over \$85 million per year on average for 2015-2019. On average, landings from the GOM/GB stock make up 93% of the total lobster landings for Massachusetts; 70% of this comes from LCMA 1, 14% from LCMA 3, and 8% from LCMA OCC (Massachusetts DMF, unpublished data).

Though the state is not directly situated on the GOM, a significant contingent of the Rhode Island commercial lobster fleet harvests lobsters in GOM/GBK. In 2019 and 2020, approximately 30% of Rhode Island’s commercial landings (2019: 604,459 pounds, 2020: 497,705 pounds) came from statistical areas in GOM/GBK. The estimated ex-vessel value for lobsters from this stock was approximately \$3.8 million in 2019 and \$2.9 million in 2020.

2.5 Current Management Measures in the GOM/GBK Stock

Lobster are currently managed under Amendment 3, and its 26 addenda. One of the hallmarks of Amendment 3 was the creation of seven LCMAs along the coast. The GOM/GBK stock is primarily comprised of LCMAs 1 and OCC as well as the northern half of LCMA 3. Each management area has a unique set of management measures. Table 2 shows the current measures for each area. Because the GOM/GBK stock is now assessed as a single area the result

¹ <https://www.maine.gov/dmr/commercial-fishing/landings/documents/lobster.table.pdf>

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is a diverse suite of regulations for each LCMA within a single stock unit, creating challenges for assessing the impacts of management measures within the stock. Specifically, the minimum gauge size (the smallest size lobster that can be legally harvested) in LCMA 1 is 3 ¼" while it is 3³/₈" in LCMA OCC and 3¹⁷/₃₂" in LCMA 3. Likewise, the maximum gauge size (the largest size lobster that can be legally harvested) differs among the three areas, with a 5" maximum gauge size in LCMA 1, a 6 ¾" maximum gauge size in LCMA 3 and for federal permit holders in LCMA OCC, and no maximum gauge size for state-only OCC permit holders. V-notch definitions are inconsistent where LCMA 1 implements a no tolerance for possession of any size v-notch or mutation and LCMA 3 defines a v-notch as greater than 1/8" with or without setal hairs while OCC has different definitions for federal permits (similar to LCMA 3) state only permits (> ¼" without setal hairs). V-notch requirements are also inconsistent, with LCMA 1 requiring all egg-bearing lobsters to be V-notched, LCMA 3 only requiring V-notching above 42°30' line, and no requirement in OCC.

Several concerns have been noted regarding the current management measures beyond these disparities. At the current minimum sizes, growth overfishing is occurring in the LCMA within the GOM/GBK stock. Growth overfishing refers to the harvest of lobsters at sizes smaller than the size where their collective biomass (and fishery yield) would be greatest, and when they have very large scope for additional growth. This is demonstrated by the potential increases in catch weight associated with increasing the minimum gauge size (see Appendix B). In LCMA 1, most of the catch consists of individuals within one molt of minimum legal size, which results in a much smaller yield-per-recruit (YPR) than could be achieved if lobsters were allowed to survive and grow to larger sizes before harvest. While the size distribution of the lobsters harvested in LCMA 3 is much broader than inshore (the fishery is less recruit-dependent) there is still considerable potential for additional growth, and delaying harvest could increase yield per recruit in this region as well. Another concern is the loss of conservation benefit of measures across LCMA lines due to inconsistent measures between areas. The 2015 assessment combined the GOM and GBK areas into one stock because the NEFSC trawl survey showed evidence of seasonal exchange and migration of lobsters between areas. Loss of conservation benefit occurs when lobsters are protected in one area but can be harvested in another when they cross the LCMA boundaries.

2.6 Biological Benefits of Modifying Gauge Sizes

Of the existing biological management measures for the lobster fishery, the minimum and maximum gauge sizes are most likely to have biological impacts on the GOM/GBK stock and fishery. Analyses were performed by the American Lobster Technical Committee to evaluate the impacts of alternate minimum and maximum sizes for the LCMA within the stock. For LCMA 1, analysis involved updating existing simulation models with more recent data to estimate the impacts of specific minimum and maximum gauge size combinations on total weight of lobsters landed, number of lobsters landed, SSB and exploitation. A separate analysis for LCMA 3 was performed due to concerns that the offshore fishery in LCMA 3 is considerably different from the inshore (which tends to drive stock-wide modelling results). For OCC, simulations were run with both LCMA 1 and LCMA 3 parameters because it is considered a transitional area. The full report on these analyses is included in Appendix B.

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Based on these analyses, several general assumptions can be made about potential changes to the minimum and maximum gauge sizes. Increasing the minimum legal gauge size in LCMA 1 is projected to result in large increases in SSB; while increasing the minimum gauge size for LCMA 3 and OCC is projected to result in much smaller increases in SSB relative to LCMA 1. This is primarily because of the significantly larger magnitude of the LCMA 1 fishery and that the current minimum legal size in LCMA is significantly below the size at maturity; meanwhile, the current minimum gauge sizes in LCMA 3 and OCC are much closer to the size at maturity and, additionally, landings from these areas account for only a small fraction of the fishery.

Minimum sizes that approach or exceed the size at maturity produce increasing returns on SSB as this allows a much larger portion of the population to reproduce at least once. Therefore, increasing minimum legal size in LCMA 1 to $3^{15}/_{32}$ " (88 mm) is projected to result in a near doubling of SSB. This would significantly increase egg production potential and may provide some buffer against the effects of future changes in productivity. At the same time, this change would be expected to produce only marginal decreases in the total number of lobsters landed but result in a net increase in YPR and total weight of catch.

Generally, decreasing maximum gauge sizes is projected to have larger effects for LCMA 3 both relative to increasing the minimum size in LCMA 3 and to changing the maximum sizes for the other LCMA's. However, relative to increasing the minimum size in LCMA 1, the positive impact to the overall stock projected to result from decreasing the maximum gauge sizes in LCMA 3 and OCC is significantly smaller.

2.7 Potential Benefits of Increasing Consistency of Measures

Beyond the biological concerns for the GOM/GBK lobster stock, the disparities in the current measures also create challenges for stock assessment, law enforcement, and commerce. Increasing consistency among the measures for the LCMA's within the stock could have benefits in each of these areas, which are described in the following sections.

2.7.1 Stock Boundaries

A complicating factor in the management of lobster is that the boundaries of the LCMA's do not align with the biological boundaries of the stocks (GOM/GBK vs. SNE). This is particularly challenging in LCMA 3 which spans both GOM/GBK and SNE. The intricacy of the stock boundaries is further complicated by the fact that many vessels fishing out of Rhode Island and Massachusetts, which are harvesting lobsters on Georges Bank, must travel through the SNE stock area to reach their port of landing. In addition, these vessels may be permitted to fish in multiple management areas, including areas that span both lobster stocks.

To date, no Commission addendum has included a recommendation that Federal permits delineate which stock a harvester in LCMA 3 is eligible to fish. In addition, management actions responding to the decline in the SNE stock have been applied throughout LCMA 3. In this case, management measures targeting the GOM/GBK stock would also be applied to all LCMA 3 harvesters regardless of location and stock fished.

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2.7.2 Improve Enforcement

A potential advantage of more consistent management measures is the ability to improve enforcement throughout the stock. Currently, disparate management measures hinder the ability for law enforcement to enforce various regulations in the lobster fishery. For example, vessels landing in Massachusetts harvest lobsters from four LCMAs, each of which has a different set of minimum gauge sizes (ranging from 3 ¼" to 3 17/32") and maximum gauge sizes (ranging from 5" to no maximum gauge size). As a result, at dealers only the most liberal measure can be implemented as a strict possession limit. The Law Enforcement Committee has continually recommended the use of standardized management measures in the lobster fishery, as inconsistent regulations mean that the least restrictive regulations becomes the enforceable standard once product leaves the dock. In addition, regulatory inconsistencies decrease the likelihood of successful prosecution of violators.

2.7.3 Interstate Shipment of Lobsters

Increasing consistency in regulations may also address concerns regarding the sale and shipment of lobsters across state lines. With decreased landings in SNE and expanding markets for the GOM/GBK stock, there has been increased demand for the shipment of lobsters across state lines. This movement of lobster can be complicated by the fact that the gauge sizes differ across LCMAs, and many states implement the minimum and maximum gauge sizes as possession limits rather than landing limits per state regulation or law. This means the gauge sizes apply to anyone in the lobster supply chain, not just harvesters. While these strict regulations improve the enforcement of gauge sizes, it can complicate interstate shipment of lobsters, particularly given the minimum size in LCMA 1 is smaller than the other management areas. As a result, some dealers must sort lobster by size in order to ship product across state lines.

Moving toward more consistent minimum sizes within the inshore LCMAs would help alleviate this issue by easing the ability of states to participate in the GOM/GBK lobster supply chain. This would not only reduce the burden on dealers that sort product by size but also enhance the enforcement of gauge sizes in the fishery.

3.0 Proposed Management Options

The following management options consider modifications to the management program with the goal of increasing protection of the GOM/GBK spawning stock. The final management program selected will apply to LCMAs 1, 3, and OCC.

- Issue 1 addresses the standardization of a subset of management measures within LCMAs and across the GOM/GBK stock.
- Issue 2 considers applying either a trigger mechanism or a predetermined schedule for implementing biological management measures that are expected to provide increased protection to the SSB.

3.1 Issue 1: Measures to be standardized upon final approval of Addendum XXVII

This issue considers options to modify some management measures immediately upon final approval of the Addendum to achieve more consistency in measures within and across LCMAs.

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One option proposes to modify some of the OCC measures to address differing regulations for state and federal permit holders. Specifically, for state-permitted fisherman in state waters there is no maximum gauge size and the V-notch definition is $\frac{1}{4}$ " without setal hairs. For federal permit holders, the maximum gauge size is $6\frac{3}{4}$ " and the V-notch definition is $\frac{1}{8}$ " with or without setal hairs. The disparity between regulations for different harvesters within the same area creates challenges for enforcement.

Options are also proposed to standardize V-notch regulations across the LCMAs within the GOM/GBK stock, as well as regulations related to the issuance of tags for trap tag losses. Uniformity in these measures would benefit enforcement and apply a consistent conservation strategy across the stock unit.

Option A: Status Quo

This option would maintain the current management measures for each LCMA at final approval of the addendum.

Option B: Standardized measures to be implemented upon final approval of addendum

The Board may select more than one of the below options. The states would be required to implement the selected management measures for the fishing year specified by the Board at final approval of the addendum.

- **Sub-option B1:** Upon final approval of the addendum, implement standardized measures within an LCMA to the most conservative measure where there are inconsistencies between state and federal regulations within GOM/GBK stock LCMAs. This would result in the maximum gauge being standardized to $6\frac{3}{4}$ " for state and federal permit holders, and the V-notch possession definition being standardized to $\frac{1}{8}$ " with or without setal hairs in OCC. This means harvest is prohibited for a female lobster with a V-shaped notch greater than $\frac{1}{8}$ ".
- **Sub-option B2:** Upon final approval of the addendum, implement a standard V-notch requirement across all LCMAs in the GOM/GBK stock. This would result in mandatory V-notching for all eggers in LCMA 1, 3, and OCC.
- **Sub-option B3:** Upon final approval of the addendum, implement a standard V-notch possession definition of $\frac{1}{8}$ " with or without setal hairs for LCMAs 1, 3, and OCC. Any jurisdiction could implement more conservative regulations.
- **Sub-option B4:** Upon final approval of the addendum, standardize regulations across LCMAs 1, 3, and OCC to limit the issuance of trap tags to equal the harvester trap tag allocation. This would mean no surplus trap tags would be automatically issued until trap losses occur and are documented.

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3.2 Issue 2: Implementing management measures to increase protection of SSB

The primary objective of this action is to increase the protection of SSB in the GOM/GBK stock. The proposed options consider changes to the minimum and maximum gauge sizes along with corresponding vent sizes for the LCMAs within the stock. The proposed measures are expected to 1) increase SSB, and 2) result in the minimum gauge size increasing to meet or exceed the size at 50% maturity (L50) for each LCMA (LCMA 1: eastern GOM L50 = 88 mm, western GOM L50 = 83 mm, LCMA 3: Georges Bank L50 = 91 mm). Appendix B includes a full technical report of analysis performed to project the impacts of various gauge size combinations on total weight of lobsters landed, number of lobsters landed, SSB and exploitation.

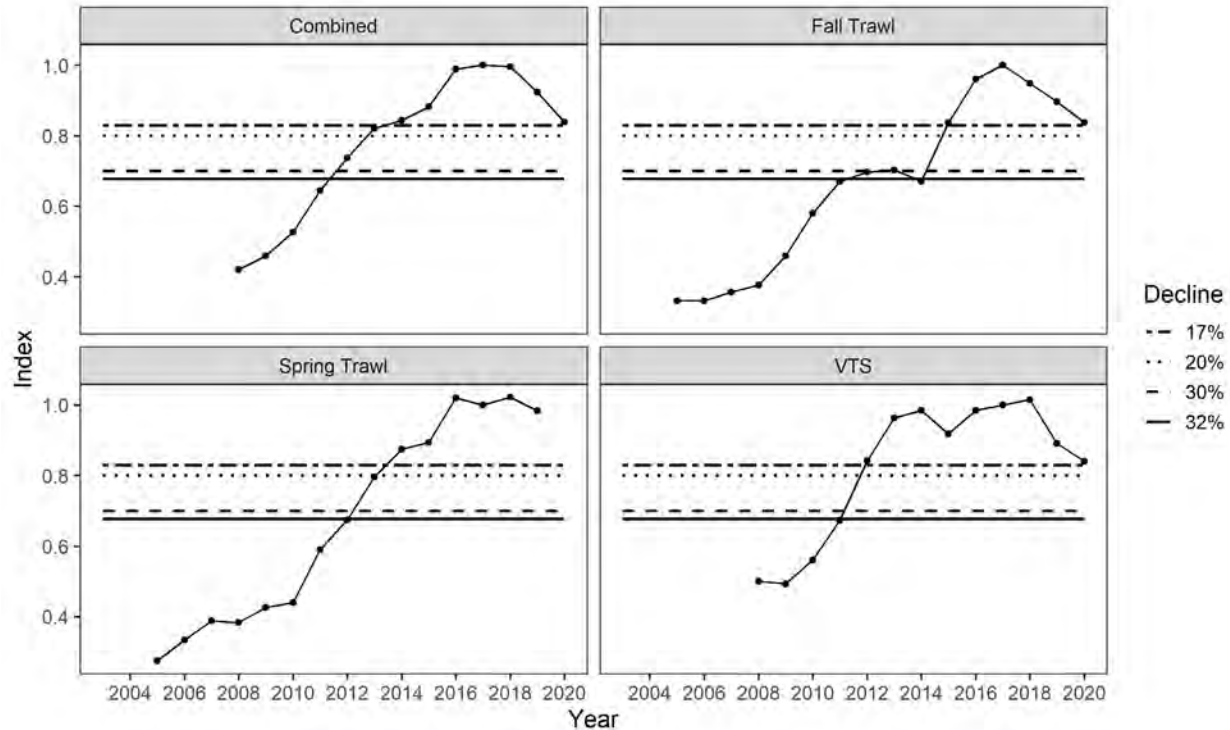
This issue proposes two approaches for implementing management changes to increase protection of SSB. One approach, which is applied in Options A through D, is to establish a trigger mechanism whereby pre-determined management changes would be triggered upon reaching a defined trigger level based on observed changes in recruit (71-80 mm carapace length) abundance indices. The proposed mechanism includes establishing up to two management triggers based on recruit conditions observed in three surveys that were used to inform the assessment model estimates of reference abundance and stock status for the GOM/GBK stock. These recruit indices include: 1) combined ME/NH and MA spring trawl survey index, 2) combined ME/NH and MA fall trawl survey index, and 3) model-based VTS index.

Each management trigger is defined by a certain level of decline in the indices from an established reference period. The reference value for each index is calculated as the average of the index values from 2016-2018. The percent declines in the indices are expected to approximate comparable declines in overall abundance of the stock, and relate to the abundance reference points established by the Board. The analyses conducted to develop the trigger mechanism and evaluate its performance in appropriately triggering management are described in detail in Appendix C. Figure 1 (top left panel) shows the calculated trigger index compared to the four proposed trigger levels in this document.

A second approach, which is applied in Option E, is to establish a pre-determined schedule for future changes to the management measures. This approach is proactive in nature and addresses the issue of growth overfishing by increasing the minimum legal size while the stock conditions are favorable.

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Figure 1. Scaled survey-specific indices and combined trigger index compared to proposed trigger levels. Top-left: combined trigger index which would be used to trigger changes in management measures. Top-right: moving three year average of fall trawl survey indices. Bottom-left: moving three year average of spring trawl survey indices. Bottom-right: moving three year average of VTS indices.



Option A: Status Quo

Under this option there would be no additional changes to the management measures for the LCMA's within the GOM/GBK stock beyond the option selected under Issue 1.

Option B: Gauge size changes triggered by 17% decline, and 32% decline in trigger index

This option would establish two triggers based on observed changes in indices of recruit abundance compared to the reference level of the trigger index. The first trigger point would be a change in the recruit abundance indices greater than or equal to a 17% decline from the reference abundance level (equal to the average of the index values from 2016-2018). Upon this trigger level being reached, the minimum gauge size for LCMA 1 would increase by $\frac{1}{16}$ " from the current size ($3\frac{1}{4}$ "") to $3\frac{5}{16}$ " for the following fishing year. All other measures would remain status quo unless triggered by a change in recruit abundance indices. The second trigger point would be a change in the recruit abundance indices greater than or equal to a 32% decline from the reference abundance level. Upon this trigger level being reached, the minimum gauge size for LCMA 1 would increase again by $\frac{1}{16}$ " from the $3\frac{5}{16}$ " to $3\frac{3}{8}$ " for the following fishing year, and the maximum gauge size in LCMA 3 and OCC would decrease to 6". The table below lists the management measures that would be automatically implemented when each trigger point is reached, with changes from the current measures in bold. The vent size in LCMA 1 would be adjusted once, corresponding with the final minimum gauge size

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change associated with Trigger 2. The final gauge and vent size changes are expected to maintain similar retention rates of legal lobsters and protection of sub-legal sizes to the current gauge and vent sizes. The final vent size is also consistent with the current vent size used in SNE for the same minimum gauge size of $3\frac{3}{8}$ ".

Option B	LCMA 1	LCMA 3	OCC
Trigger 1 (17% decline)	Minimum gauge: $3\frac{5}{16}$" (84 mm) Maximum gauge: status quo, 5" Vent size: status quo	Minimum gauge: status quo, $3\frac{17}{32}$ " (90 mm) Maximum gauge: status quo, $6\frac{3}{4}$ " (171 mm) Vent size: status quo	Minimum gauge: status quo, $3\frac{3}{8}$ " (86 mm) Max: status quo, $6\frac{3}{4}$ " (171 mm) Vent size: status quo
Trigger 2 (32% decline)	Minimum gauge: $3\frac{3}{8}$" (86 mm) Maximum gauge: status quo Vent size: 2 x $5\frac{3}{4}$" rectangular; $2\frac{5}{8}$" circular	Minimum gauge: status quo Maximum gauge: 6" Vent size: status quo	Minimum gauge: status quo Maximum gauge: 6" Vent size: status quo

The proposed increases to the minimum gauge sizes in LCMA 1 and OCC are expected to increase the proportion of the population protected from harvest by the fishery before being able to reproduce. The proposed decreases to the maximum gauge sizes in LCMA 3 and OCC are expected to enhance resiliency by placing forever protections on a small proportion of the population, including larger lobsters of both sexes.

Option C: Gauge size changes triggered by 20% decline, and 30% decline in trigger index

This option is identical to Option B above, with the exception of the trigger levels that would result in changes to the management measures. Under this option, the first trigger point would be a change in the recruit abundance indices greater than or equal to a 20% decline from the reference abundance level (equal to the average of the index values from 2016-2018), and the second trigger point would be a change in the recruit abundance indices greater than or equal to a 30% decline from the reference abundance level. The measures that would be implemented when each trigger level is reached are shown in the table below.

Option C	LCMA 1	LCMA 3	OCC
Trigger 1 (20% decline)	Minimum gauge: $3\frac{5}{16}$" (84 mm) Maximum gauge: status quo, 5" Vent size: status quo	Minimum gauge: status quo, $3\frac{17}{32}$ " (90 mm) Maximum gauge: status quo, $6\frac{3}{4}$ " (171 mm) Vent size: status quo	Minimum gauge: status quo, $3\frac{3}{8}$ " (86 mm) Max: status quo, $6\frac{3}{4}$ " (171 mm) Vent size: status quo

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Trigger 2 (30% decline)	Minimum gauge: 3 3/8" (86 mm) Maximum gauge: status quo Vent size: 2 x 5 3/4" rectangular; 2 5/8" circular	Minimum gauge: status quo Maximum gauge: 6" Vent size: status quo	Minimum gauge: status quo Maximum gauge: 6" Vent size: status quo
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Option D: Gradual change in gauge sizes triggered by 17% decline in trigger index

This option considers establishing a trigger level which, upon being reached, would initiate a series of gradual changes in gauge sizes for the LCMAs in the GOM/GBK stock. The minimum gauge size would change in increments of $\frac{1}{16}$ ", and the maximum gauge size would change in increments of $\frac{1}{4}$ ". The first change would be triggered by a change in the recruit abundance indices greater than or equal to a 17% decline from the reference abundance level (equal to the average of the index values from 2016-2018). Following this initial change, incremental changes to the gauge sizes would occur every other year. The gauge size changes that would be implemented at each step, and the final gauge sizes that would be reached for each area are shown in the table below. The vent size in LCMA 1 would be adjusted once, corresponding with the final minimum gauge size change in year 5. The final gauge and vent size changes are expected to maintain similar retention rates of legal lobsters and protection of sub-legal sizes to the current gauge and vent sizes. The final vent size is also consistent with the current vent size used in SNE for the same minimum gauge size of $3\frac{3}{8}$ ".

Option D	LCMA 1	LCMA 3	OCC
Current Measures (Year 0)	Minimum gauge: $3\frac{1}{4}$ " Maximum gauge: 5" Vent size: status quo	Minimum gauge: $3\frac{17}{32}$ " Maximum gauge: $6\frac{3}{4}$ " Vent size: status quo	Minimum gauge: $3\frac{3}{8}$ " Maximum gauge: $6\frac{3}{4}$ " Vent size: status quo
Trigger 1 (17% decline) (Year 1)	Minimum gauge: $3\frac{5}{16}$" (84 mm) Maximum gauge: status quo Vent size: status quo	Minimum gauge: status quo Maximum gauge: $6\frac{1}{2}$" Vent size: status quo	Minimum gauge: status quo Maximum gauge: $6\frac{1}{2}$" Vent size: status quo
Intermediate gauge sizes (Year 3)	Minimum gauge: $3\frac{3}{8}$" (86 mm) Maximum gauge: status quo Vent size: status quo	Minimum gauge: status quo Maximum gauge: $6\frac{1}{4}$" Vent size: status quo	Minimum gauge: status quo Maximum gauge: $6\frac{1}{4}$" Vent size: status quo
Final gauge and vent sizes (Year 5)	Minimum gauge: $3\frac{3}{8}$ " Maximum gauge: status quo Vent size: 2 x $5\frac{3}{4}$" rectangular; $2\frac{5}{8}$" circular	Minimum gauge: status quo Maximum gauge: 6" Vent size: status quo	Minimum gauge: status quo Maximum gauge: 6" Vent size: status quo

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Option E: Scheduled changes to minimum gauge size in LCMA 1

This option considers establishing a predetermined schedule for implementing gradual changes to the minimum gauge and vent size in LCMA 1 to increase the SSB (see table below for the proposed changes). The first step increases the minimum gauge size in LCMA 1 by $\frac{1}{16}$ " to $3\frac{5}{16}$ " for the 2023 fishing year. In the final year of adjustments, the minimum gauge size in LCMA 1 would be increased to $3\frac{3}{8}$ " for the 2025 fishing year. The vent size in LCMA 1 would also be adjusted once, at the same time the final gauge size is implemented in 2025. The final gauge and vent size changes are expected to maintain similar retention rates of legal lobsters and protection of sub-legal sizes to the current gauge and vent sizes.

Option E	LCMA 1	LCMA 3	OCC
2023 fishing year measures	Min: $3\frac{5}{16}$" (84 mm) Max: status quo Vent size: status quo	Min: status quo Max: status quo	Min: status quo Max: status quo
2025 fishing year measures	Min: $3\frac{3}{8}$ (86 mm) Max: status quo Vent size: $2 \times 5\frac{3}{4}$" rectangular; $2\frac{5}{8}$" circular	Min: status quo Max: status quo	Min: status quo Max: status quo

3.3 Implementation of Management Measures in LCMA 3

Although only a portion of LCMA 3 encompasses the GOM/GBK stock (see Section 2.8 Stock Boundaries for additional information), any measures selected by the Board pertaining to LCMA 3 would apply to all LCMA 3 permit holders, including those that fish in the SNE stock.

Given the objective of this addendum is specific to protecting the GOM/GBK spawning stock, new management measures must either apply to all LCMA 3 harvesters regardless of location and stock fished (and therefore also impact the SNE fishery) or new measures would have to be stock (and geographic area) specific in order to only affect the GOM/GBK fishery. For example, an LCMA 3 harvester seeking to continue fishing in GOM/GBK would either have to declare and be permitted to fish within the GOM/GBK stock area to be held accountable, or opt to not participate in the GOM/GBK fishery to avoid the more restrictive measures. Applying the selected measures to only the GOM/GBK portion of LCMA 3 would create a significant administrative burden to appropriately divide LCMA 3 in a way to minimize impacts and issue permits and enforce measures based on this division. In addition, dividing LCMA3 creates potential for confusion and noncompliance among LCMA 3 permit holders, particularly as there are other ongoing activities in this area affecting a permit holder's fishing plans, including closures for protected species, development of other ocean uses, and the overlap with the Jonah crab fishery. To date, there have been no Commission addenda that included a recommendation that Federal permits specify the stock area in which an LCMA 3 harvester is eligible to fish.

Applying the measures across the entire management area is consistent with previous changes to the management measures in LCMA 3. When several addenda implemented reductions in

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fishing capacity (Addendum XVIII) and the Area 3 conservation tax (Addendum XIX) to address the declining condition of the SNE stock, the measures were also applied to the GOM/GBK portion of LCMA 3, which was not overfished nor experiencing overfishing. Though the impacts of the proposed measures on the SNE stock and fishery have not been analyzed, it is likely that the proposed changes would have only trivial negative impacts to catch and positive impacts to SSB considering the current depleted status of the stock.

4.0 Compliance

If the existing FMP is revised by approval of this draft addendum, the American Lobster Management Board will designate dates by which states will be required to implement the provisions included in the addendum. A final implementation schedule will be identified based on the management tools chosen.

5.0 Recommendations for Actions in Federal Waters

The management of American lobster in the EEZ is the responsibility of the Secretary of Commerce through the National Marine Fisheries Service. The Atlantic States Marine Fisheries Commission recommends that the federal government promulgate all necessary regulations in Section 3.0 to implement complementary measures to those approved in this addendum.

6.0 References

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7.0 Tables and Figures

Table 1. Existing LCMA specific management measures.

Mgmt. Measure	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6	OCC
Min Gauge Size	3 1/4"	3 3/8"	3 17/32"	3 3/8"	3 3/8"	3 3/8"	3 3/8"
Vent Rect.	1 15/16 x 5 3/4"	2 x 5 3/4"	2 1/16 x 5 3/4"	2 x 5 3/4"	2 x 5 3/4"	2 x 5 3/4"	2 x 5 3/4"
Vent Cir.	2 7/16"	2 5/8"	2 11/16"	2 5/8"	2 5/8"	2 5/8"	2 5/8"
V-notch requirement	Mandatory for all eggers	Mandatory for all legal size eggers	Mandatory for all eggers above 42°30'	Mandatory for all eggers in federal waters. No V-notching in state waters.	Mandatory for all eggers	None	None
V-notch Definition ¹ (possession)	Zero Tolerance	1/8" with or w/out setal hairs ¹	1/8" with or w/out setal hairs ¹	1/8" with or w/out setal hairs ¹	1/8" with or w/out setal hairs ¹	1/8" with or w/out setal hairs ¹	State Permitted fisherman in state waters 1/4" without setal hairs Federal Permit holders 1/8" with or w/out setal hairs ¹
Max. Gauge (male & female)	5"	5 1/4"	6 3/4"	5 1/4"	5 1/4"	5 1/4"	State Waters none Federal Waters 6 3/4"
Season Closure				April 30-May 31 ²	February 1-March 31 ³	Sept 8-Nov 28 ⁴	February 1-April 30

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Table 2. GOM/GBK model-free indicators for the 2020 Stock Assessment. The left table shows the GOM spawning stock abundance, the right table shows GBK spawning stock abundance.

SPAWNING STOCK ABUNDANCE						
Mean weight (g) per tow of mature females						
Survey	NESFC		ME/NH		MA 514	
	fall	spring	fall	spring	fall	spring
1981	175.32	400.28			502.65	430.53
1982	39.45	113.58			626.48	151.21
1983	206.03	234.21			844.76	67.08
1984	234.64	443.81			593.77	126.47
1985	499.62	2771.23			919.56	93.81
1986	267.97	502.99			231.88	112.97
1987	85.35	497.40			194.34	148.62
1988	186.56	244.92			200.58	88.14
1989	325.69	247.15			293.61	230.26
1990	216.65	516.20			1048.72	241.94
1991	247.11	430.56			335.80	165.54
1992	193.95	453.31			512.83	212.89
1993	284.34	484.30			120.59	229.72
1994	430.32	720.67			783.17	285.01
1995	464.96	390.15			520.26	171.71
1996	734.25	872.53			569.39	156.53
1997	568.34	1083.76			235.18	114.78
1998	381.81	1182.44			282.79	170.21
1999	1444.07	807.41			365.53	282.12
2000	585.66	1281.05	4430.55		533.40	236.55
2001	511.25	1498.42	2446.85	690.89	165.74	235.85
2002	1789.42	2022.04	4638.64	1436.34	324.34	175.73
2003	985.93	2343.63	3949.63	1226.05	129.67	72.99
2004	685.89	2773.35	3610.67	907.07	120.27	259.35
2005	465.35	1670.29	4805.25	1990.08	248.23	489.12
2006	681.87	1810.96	3698.94	1327.93	240.27	410.97
2007	445.78	1536.47	3163.24	1437.85	176.95	139.94
2008	805.10	1894.91	4080.36	1107.00	559.70	300.35
2009	1787.92	1864.92	6906.45	1747.30	630.52	219.83
2010	2850.60	2476.79	5793.51	1886.61	1424.75	211.52
2011	2317.94	2089.39	6169.40	2013.80	1268.44	267.51
2012	3215.29	3516.38	4174.85	2287.55	889.87	124.81
2013	3299.56	2499.71	5363.14	2007.92	1135.54	300.86
2014	4979.28	3083.09	5891.58	3010.73	768.88	382.81
2015	3553.44	3665.39	8488.62	2233.05	1947.04	418.46
2016	3692.26	5142.42	7691.01	2613.49	3712.66	1119.26
2017	3274.69	6566.80	4629.68	2530.74	2309.44	564.30
2018	2093.20	3555.09	5242.34	2005.07	2782.55	550.68
2014-2018 mean	3518.57	4402.56	6388.65	2478.62	2304.11	607.10

25th median	272.06	487.57	4015.00	1355.03	242.26	149.27
75th	539.79	1389.74	4638.64	1938.34	526.83	224.78
75th	1789.05	2443.50	5842.54	2178.24	878.60	296.52

SPAWNING STOCK ABUNDANCE		
Mean weight (g) per tow of mature females		
Survey	NESFC	
	fall	spring
1981	707.14	69.71
1982	670.07	123.96
1983	643.84	152.05
1984	397.33	45.17
1985	504.87	39.00
1986	491.96	307.05
1987	537.31	113.27
1988	695.27	307.49
1989	933.18	161.43
1990	761.64	103.62
1991	848.03	164.32
1992	817.25	213.11
1993	626.81	126.03
1994	774.61	41.77
1995	939.85	71.74
1996	1051.09	482.61
1997	754.00	62.46
1998	993.56	64.67
1999	1363.68	395.66
2000	945.69	132.57
2001	1756.38	313.41
2002	2183.80	341.90
2003	1030.19	842.92
2004	1557.16	298.95
2005	1404.20	491.00
2006	2123.43	465.72
2007	1859.53	728.26
2008	3074.33	1827.61
2009	3703.99	1336.34
2010	2120.51	1126.52
2011	4681.76	1113.11
2012	2696.38	1510.08
2013	2530.26	1369.39
2014	3012.69	1833.98
2015	3743.71	1509.13
2016	3020.98	2138.96
2017	6627.18	3749.60
2018	9630.86	725.09
2014-2018 mean	5207.09	1991.35

25th median	755.91	124.47
75th	1040.64	310.45
75th	2443.64	1045.56

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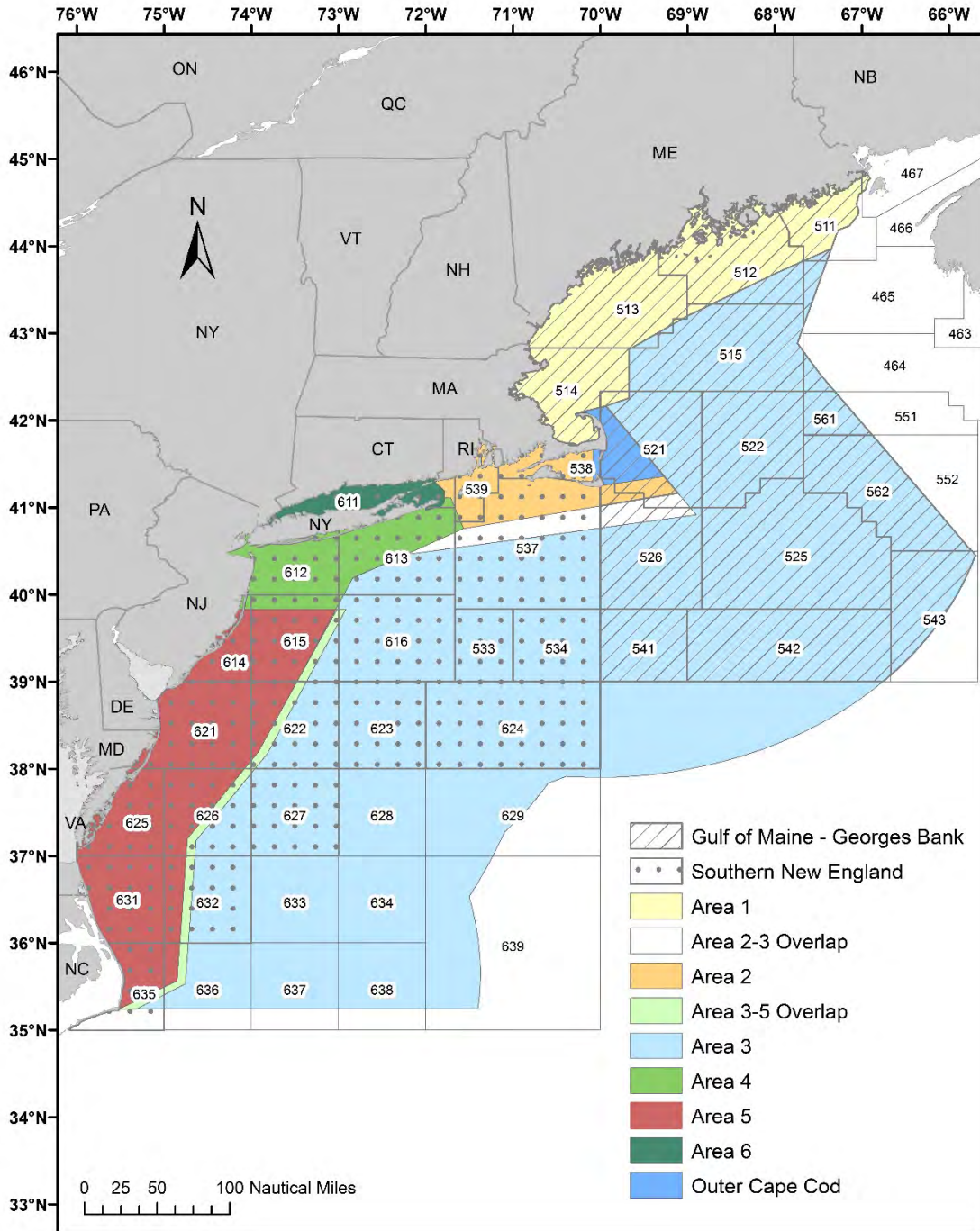


Figure 1. Lobster conservation management areas (LCMA) in the American lobster fishery. LCMA 1, 3, and OCC make up the majority of the GOM/GBK stock.

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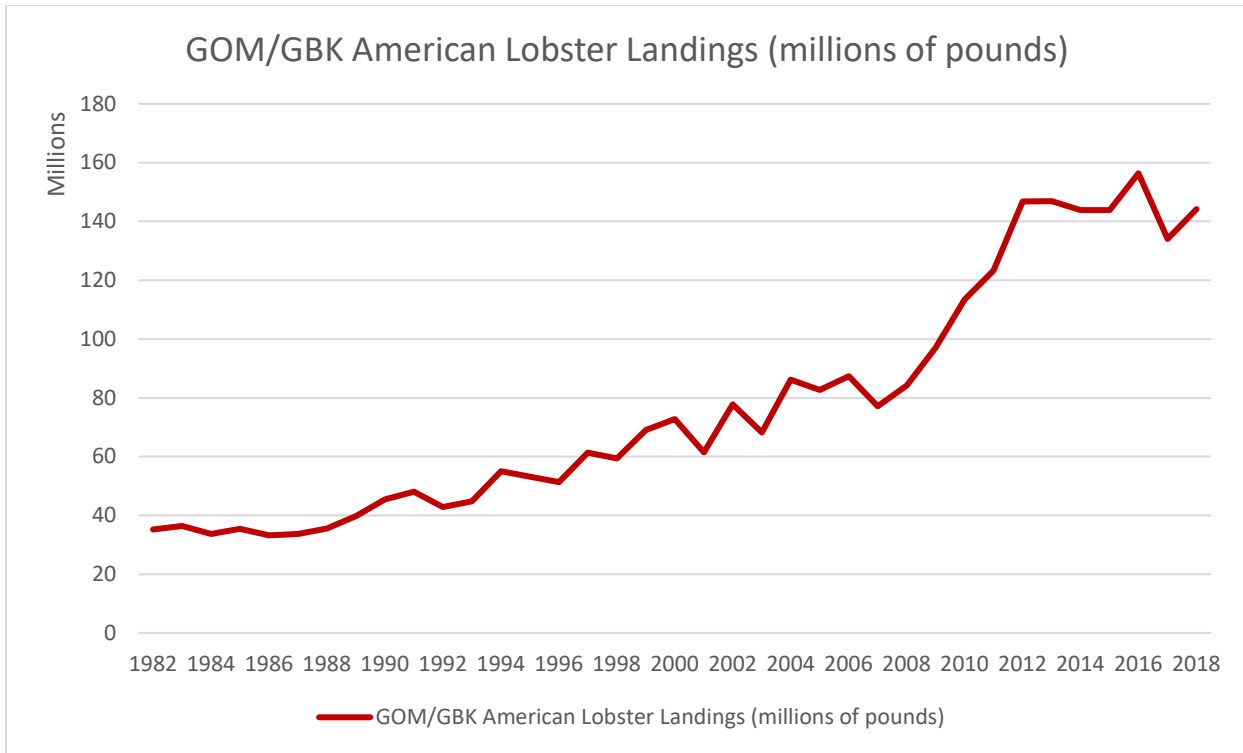


Figure 2. Landings in the GOM/GBK stock (1982-2018). Stock specific landings are updated during each benchmark stock assessment.

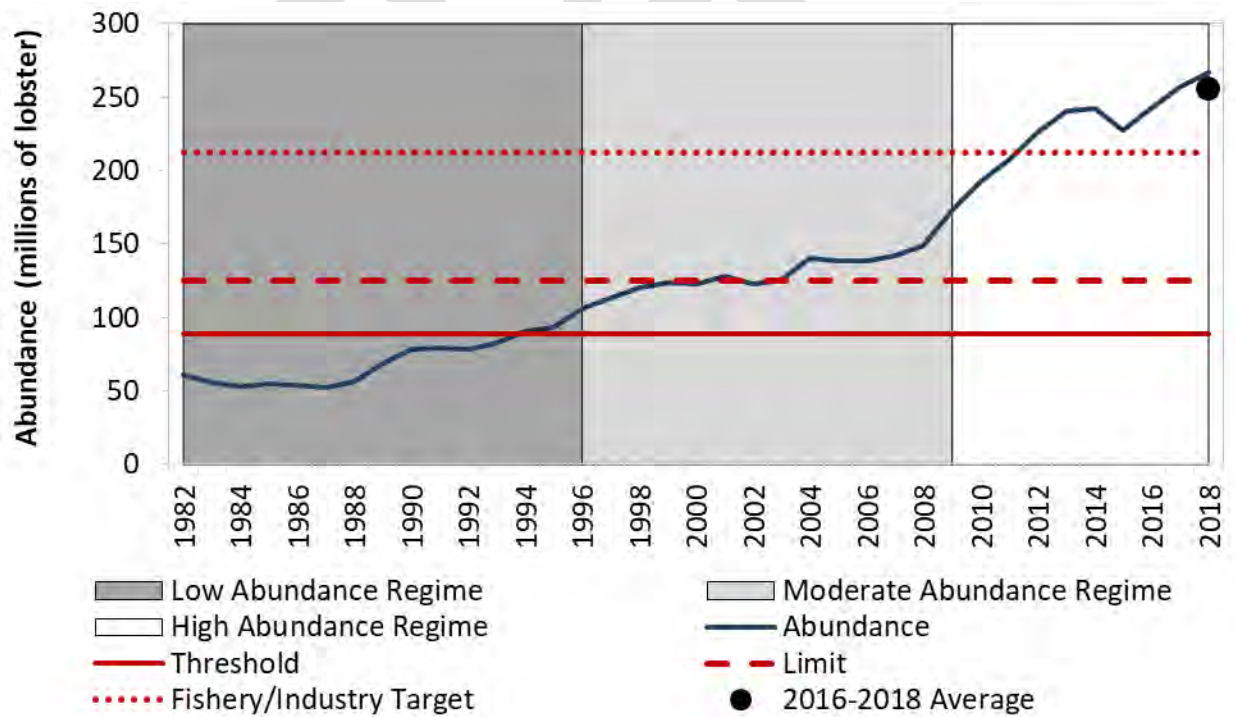


Figure 3. Stock abundance

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Appendix A. 2021 Annual Data Update of American Lobster GOM/GBK Stock Indicators

Background

An annual Data Update process between American lobster stock assessments was recommended during the 2020 stock assessment to more closely monitor changes in stock abundance. The objective of this process is to present information—including any potentially concerning trends—that could support additional research or consideration of changes to management. Data sets recommended for this process were generally those that indicate exploitable lobster stock abundance conditions expected in subsequent years and include:

- YOY settlement indicators
- Trawl survey indicators, including recruit abundance (71-80 mm carapace length lobsters) and survey encounter rate
- Ventless trap survey sex-specific model-based abundance indices (53 mm+ carapace length lobsters)

For this first Data Update, data sets were updated with data since the stock assessment (i.e., 2019 and 2020). Indicator status (negative, neutral, or positive – see table below) was determined relative to the percentiles of the stock assessment time series (i.e., data set start year through 2018).

Indicator	< 25 th percentile	Between 25 th and 75 th percentile	> 75 th percentile
YOY settlement (larval or YOY)	Negative	Neutral	Positive
Trawl survey recruit abundance	Negative	Neutral	Positive
Trawl survey encounter rate	Negative	Neutral	Positive
Ventless trap survey abundance	Negative	Neutral	Positive

The five year means provided during the stock assessment (2014-2018) for terminal indicator status determinations were also updated with the new years of data. This treatment of data is consistent with the stock indicators provided during stock assessments (see Section 5 in the stock assessment report for more detail) with two important notes. First, the ventless trap survey abundance indices have not been presented as stock indicators in past assessments due to concerns that the short time series is not representative of the stock’s productivity potential. These indices are included in this Data Update, along with the other data sets, specifically to show changes in stock conditions since the 2020 stock assessment. The Technical Committee recommended these indices be presented as indices by NOAA statistical area. Stratification of the ventless trap survey was designed around these statistical areas, unlike the trawl surveys, and these indices provide better spatial resolution to examine abundance trends within the stock boundary. The ventless trap survey index model developed during the stock assessment was structured to estimate stockwide indices and has not been evaluated for estimating indices by statistical area, so these indices are design-based calculations as opposed to model-based indices originally recommended for the Data Update process. Second, the covid-19 pandemic had substantial impacts on data collection in 2020 and many of the trawl surveys providing these data sets did not sample which impacts the updated five year means provided in the results. Below are the results of the data updates by sub-stock.

Results

Gulf of Maine (GOM)

- YOY conditions showed improvements, but were still not positive (Table 1 and Figure 1).

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- Updated five year means were all neutral, whereas two of five were negative during the stock assessment.
- All 2019 and 2020 values were neutral except the MA 514 value in 2019 which was negative.
- Trawl survey recruit abundance indicators showed positive conditions similar to conditions during the stock assessment (Table 2 and Figure 2).
 - Five of six indicators were not available for 2020 due to covid-19 sampling restrictions.
 - Updated five year means were all positive, as they were during the stock assessment.
 - The only value available for 2020 (ME/NH Fall) was the first neutral annual value observed since 2015.
 - Fall indicators tended to show declining trends in the last few years of available data that were not apparent in spring indicators.
- Trawl survey encounter rates were similar to conditions during the stock assessment, but did show some deterioration from positive to neutral conditions (Table 3 and Figure 3).
 - Five of six indicators were not available for 2020 due to covid-19 sampling restrictions.
 - Three of six updated five year means were neutral, whereas only one was neutral during the stock assessment. All others were positive.
- Ventless trap survey indices showed abundance declining since the stock assessment (Table 4 and Figure 4).
 - Six of eight updated five year means were neutral, whereas only four of eight were neutral during the stock assessment. All others were positive.
 - The two positive updated five year means were for the two sexes in the northern-most statistical area (511). Despite the positive means, the 2020 values for both sexes showed strong declines to neutral conditions.
 - The female survey value in 2020 and the male value in 2019 and 2020 in the southern-most statistical area (514) were negative, the first negative values observed in the stock since 2014.

Georges Bank (GBK)

- Trawl survey recruit abundance indicators showed deteriorating conditions since the stock assessment (Table 5 and Figure 5).
 - No indicators were available for 2020 due to covid-19 sampling restrictions.
 - Updated means for one of the two indicators changed from neutral to negative. Both were neutral during the stock assessment.
 - These indicators tend to be noisier than some of the other abundance indicators, with high interannual variability and lack of discernible trends.
- Trawl survey encounter rates were positive and similar to conditions during the stock assessment (Table 6 and Figure 6).
 - No indicators were available for 2020 due to covid-19 sampling restrictions.
 - Updated means for both indicators were positive. This is unchanged from the stock assessment.

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Tables and Figures

Table 1. GOM abundance indicators: YOY indices.

YOUNG-OF-YEAR INDICES					
Survey	ME				MA 514
	511	512	513 East	513 West	
1981					
1982					
1983					
1984					
1985					
1986					
1987					
1988					
1989			1.64		
1990			0.77		
1991			1.54		
1992			1.30		
1993			0.45		
1994			1.61		
1995		0.02	0.66		1.01
1996		0.05	0.47		0.00
1997		0.05	0.46		0.10
1998		0.00	0.14		0.03
1999		0.04	0.65		0.43
2000	0.00	0.10	0.13	0.17	0.07
2001	0.24	0.43	2.08	1.17	0.43
2002	0.13	0.29	1.38	0.85	1.00
2003	0.22	0.27	1.75	1.22	0.78
2004	0.18	0.36	1.75	0.67	1.13
2005	1.59	1.36	1.77	0.82	1.11
2006	0.58	1.13	0.84	0.82	0.46
2007	0.84	1.34	2.01	1.27	1.38
2008	0.42	0.83	1.08	0.97	0.33
2009	0.69	0.48	1.25	0.45	0.17
2010	0.28	0.72	0.80	0.47	0.50
2011	0.41	1.10	2.33	0.67	0.64
2012	0.53	0.73	1.06	0.22	0.09
2013	0.10	0.20	0.48	0.12	0.00
2014	0.16	0.43	0.83	0.33	0.11
2015	0.11	0.22	0.43	0.05	0.00
2016	0.13	0.21	0.47	0.12	0.08
2017	0.16	0.36	0.70	0.20	0.08
2018	0.27	0.32	0.71	0.20	0.03
2014-2018 mean	0.17	0.31	0.63	0.18	0.06
2019	0.42	0.61	1.03	0.35	0.06
2020	0.29	0.49	1.17	0.25	0.19
2016-2020 mean	0.25	0.40	0.82	0.23	0.09
25th	0.15	0.18	0.52	0.20	0.08
median	0.24	0.34	0.84	0.47	0.25
75th	0.48	0.72	1.59	0.84	0.67

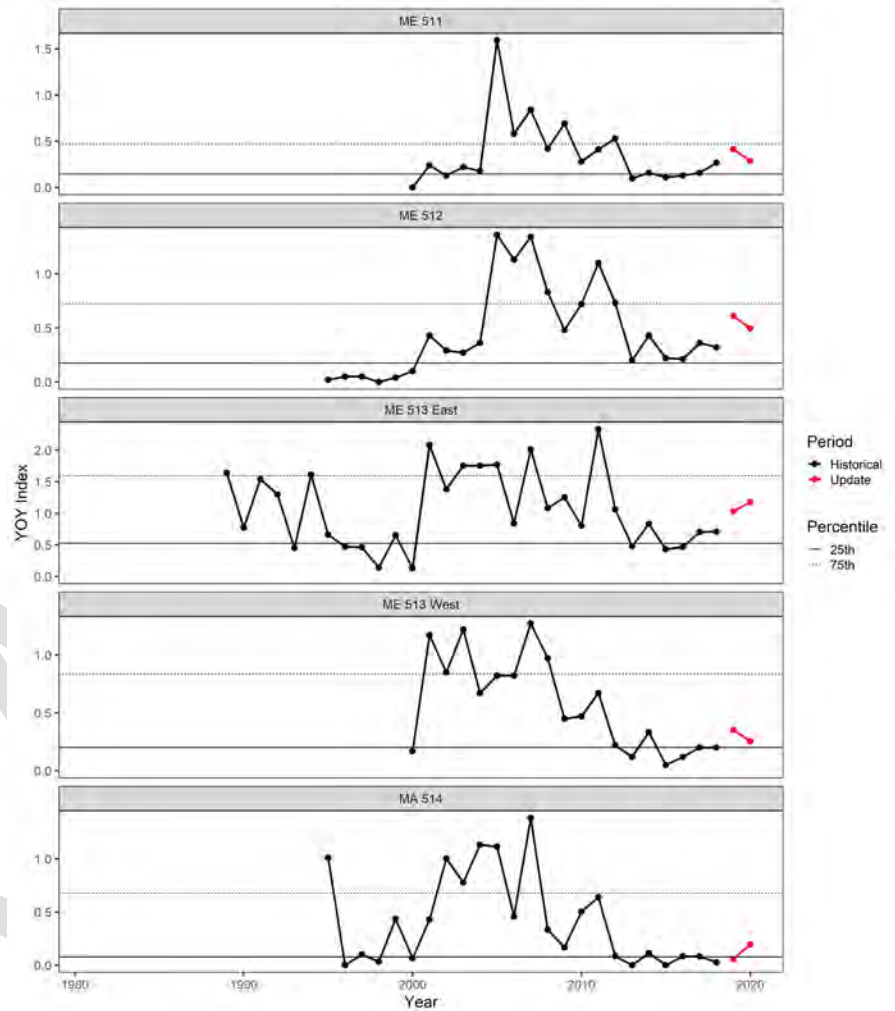


Figure 1. GOM abundance indicators: YOY indices.

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Table 2. GOM abundance indicators: trawl survey recruit abundance.

RECRUIT ABUNDANCE (SURVEY)						
Abundance of lobsters 71 - 80 mm CL (sexes combined)						
Survey	NEFSC		ME/NH		MA 514	
	Spring	Fall	Spring	Fall	Spring	Fall
1981	0.13	0.06			6.43	4.80
1982	0.29	0.42			2.77	3.89
1983	0.28	0.90			1.77	9.71
1984	0.20	0.31			2.17	6.13
1985	0.14	1.41			4.44	9.50
1986	0.27	1.29			2.99	3.83
1987	0.67	0.57			2.42	1.17
1988	0.67	1.21			2.50	4.14
1989	0.00	1.61			4.45	7.53
1990	0.27	1.76			6.12	15.36
1991	0.55	1.41			2.74	7.55
1992	0.50	1.37			4.32	9.01
1993	0.25	0.86			5.14	3.20
1994	0.15	2.75			7.54	13.87
1995	1.45	1.44			4.55	12.18
1996	0.76	4.59			3.11	11.96
1997	2.02	2.12			4.59	6.48
1998	1.59	2.16			4.52	7.54
1999	1.51	3.01			4.25	8.73
2000	4.64	3.01		24.09	4.25	8.89
2001	1.05	1.51	9.28	17.81	4.31	1.59
2002	1.08	1.91	22.00	22.41	3.41	5.00
2003	1.41	0.36	10.65	18.32	1.96	0.67
2004	0.84	2.26	7.55	12.29	2.47	1.30
2005	0.34	0.87	18.51	25.90	4.40	2.12
2006	2.17	1.27	18.07	18.30	6.09	5.29
2007	1.62	0.64	15.91	16.82	0.77	1.58
2008	0.99	2.41	17.88	31.61	2.54	6.14
2009	4.88	4.90	24.72	32.67	3.20	8.91
2010	2.98	4.53	17.66	37.35	2.20	9.53
2011	10.27	11.83	39.25	46.09	5.24	14.98
2012	11.25	6.74	36.55	37.12	3.03	11.35
2013	10.93	18.12	34.50	37.86	4.82	12.16
2014	11.66	21.54	50.79	41.95	3.35	7.05
2015	14.44	17.89	38.51	67.99	7.09	17.86
2016	13.25	22.54	50.83	60.07	13.58	17.41
2017	15.74		48.42	48.13	7.85	13.63
2018	14.15	15.87	42.77	55.84	5.25	25.62
2014-2018 mean	13.84	19.46	46.27	54.80	7.43	16.31
2019	16.69	7.62	46.37	50.85	10.78	14.61
2020				34.65		
2016-2020 mean	14.95	15.34	47.10	49.91	9.37	17.82
25th median	0.30	1.21	17.72	20.36	2.75	4.30
75th	1.07	1.76	23.36	32.67	4.28	7.55
	4.23	4.53	39.07	44.02	5.06	11.81

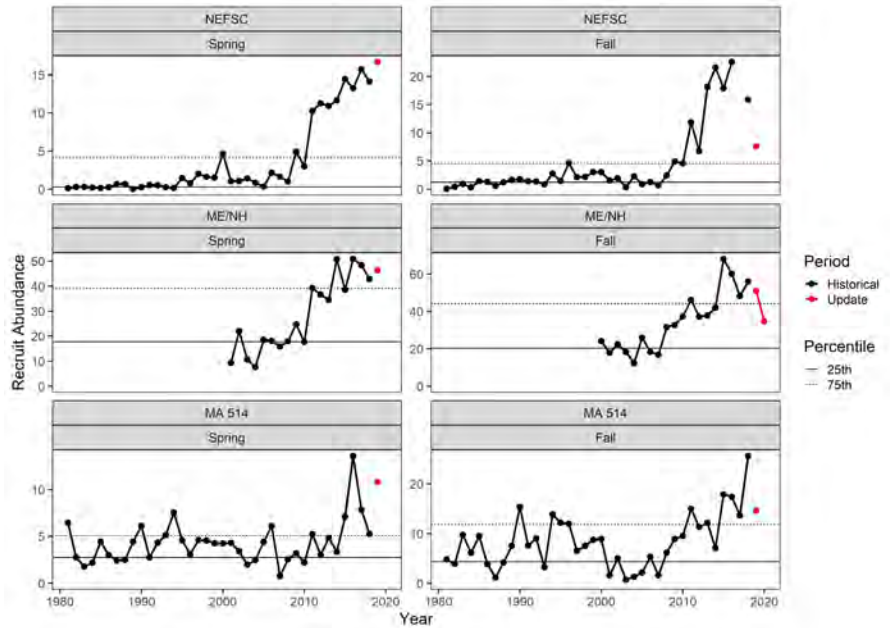


Figure 2. GOM abundance indicators: trawl survey recruit abundance.

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Table 3. GOM abundance indicators: trawl survey encounter rate.

SURVEY LOBSTER ENCOUNTER RATE						
Proportion of positive tows						
Survey	NEFSC		ME/NH		MA 514	
	Spring	Fall	Spring	Fall	Spring	Fall
1981	0.44	0.25			0.86	0.73
1982	0.34	0.18			0.50	0.70
1983	0.26	0.33			0.76	0.76
1984	0.28	0.36			0.76	0.76
1985	0.38	0.49			0.71	0.67
1986	0.33	0.47			0.68	0.83
1987	0.43	0.24			0.85	0.54
1988	0.31	0.30			0.76	0.58
1989	0.19	0.35			0.78	0.95
1990	0.41	0.32			0.86	0.95
1991	0.42	0.32			0.87	0.94
1992	0.40	0.24			0.93	0.77
1993	0.41	0.39			0.97	0.82
1994	0.45	0.40			1.00	0.93
1995	0.41	0.37			0.93	0.93
1996	0.54	0.54			0.91	0.96
1997	0.64	0.35			0.93	0.86
1998	0.52	0.40			0.76	0.69
1999	0.51	0.42			0.73	0.91
2000	0.63	0.42		0.94	0.93	0.98
2001	0.57	0.40	0.88	0.86	0.93	0.72
2002	0.75	0.53	0.94	0.95	0.91	0.73
2003	0.69	0.44	0.92	0.85	0.82	0.55
2004	0.87	0.31	0.89	0.86	0.84	0.56
2005	0.77	0.36	0.95	0.91	0.95	0.67
2006	0.72	0.60	0.93	0.93	0.91	0.88
2007	0.72	0.43	0.97	0.85	0.51	0.54
2008	0.84	0.49	0.92	0.86	0.83	0.75
2009	0.82	0.63	0.98	0.92	0.89	0.87
2010	0.85	0.75	0.98	0.96	0.87	0.98
2011	0.83	0.74	0.99	0.96	0.89	0.85
2012	0.86	0.78	0.98	0.98	0.91	0.95
2013	0.87	0.73	1.00	0.93	0.96	0.96
2014	0.90	0.71	1.00	0.99	0.79	0.96
2015	0.93	0.69	1.00	0.96	0.98	0.95
2016	0.94	0.75	1.00	0.96	0.96	0.97
2017	0.86		0.99	0.94	0.84	0.98
2018	0.86	0.71	0.98	0.96	0.84	0.90
2014-2018 mean	0.90	0.72	0.99	0.96	0.88	0.95
2019	0.83	0.71	0.99	0.95	0.85	0.93
2020				0.96		
2016-2020 mean	0.87	0.72	0.99	0.95	0.87	0.94
25th	0.41	0.35	0.93	0.89	0.78	0.72
median	0.60	0.42	0.98	0.94	0.86	0.86
75th	0.84	0.60	0.99	0.96	0.93	0.95

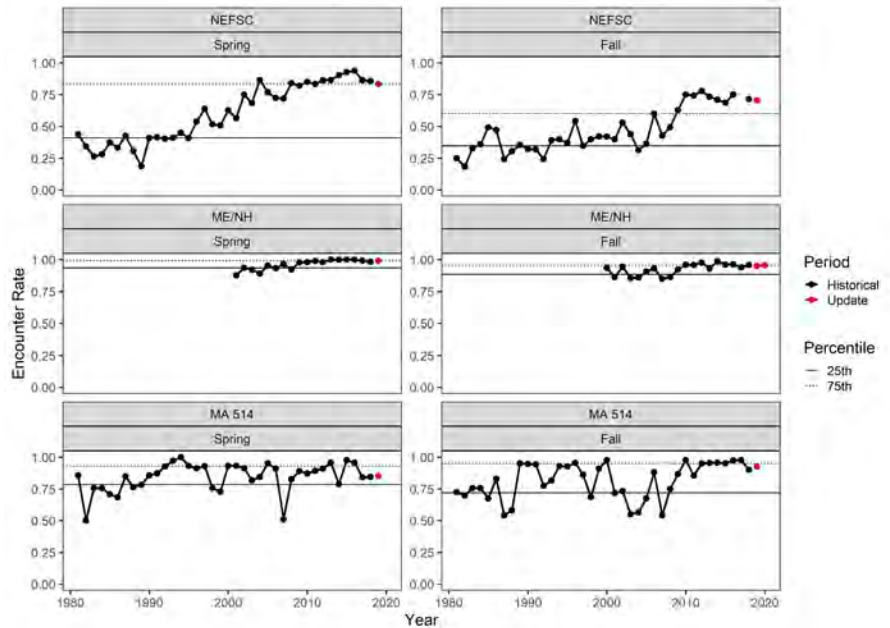


Figure 3. GOM abundance indicators: trawl survey encounter rate.

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Table 4. GOM abundance indicators: ventless trap survey abundance.

VENTLESS TRAP ABUNDANCE								
Abundance of lobsters > 53 mm CL								
Survey	511		512		513		514	
	Female	Male	Female	Male	Female	Male	Female	Male
1981								
1982								
1983								
1984								
1985								
1986								
1987								
1988								
1989								
1990								
1991								
1992								
1993								
1994								
1995								
1996								
1997								
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2002								
2003								
2004								
2005								
2006	7.65	5.34	6.87	5.38	5.73	4.37	3.10	3.40
2007	5.06	3.91	3.95	3.83	5.82	4.35	1.85	1.84
2008	4.94	3.87	5.78	4.95	5.78	4.97	2.77	2.51
2009	3.60	2.65	6.31	5.35	6.89	5.53	2.72	2.66
2010	5.66	3.90	6.95	5.69	6.61	5.27	2.49	2.22
2011	8.70	6.52	11.10	8.48	7.32	5.60	3.47	2.60
2012	10.95	7.64	12.06	9.47	11.40	7.72	5.21	4.52
2013	11.14	7.95	11.87	8.64	9.36	6.49		
2014	10.38	6.63	11.92	8.04	7.74	4.96	3.15	2.35
2015	8.47	4.63	10.39	7.70	8.57	5.50	4.01	3.16
2016	14.59	9.15	14.34	10.75	10.78	7.56	4.79	3.56
2017	11.69	7.07	11.61	8.52	8.46	5.56	3.38	2.45
2018	15.10	9.43	11.26	8.23	9.57	6.37	3.47	2.43
2014-2018 mean	12.05	7.38	11.90	8.65	9.02	5.99	3.76	2.79
2019	12.93	8.27	8.23	5.96	8.59	5.20	2.85	1.93
2020	7.65	5.44	7.95	5.95	9.29	6.61	2.50	1.69
2016-2020 mean	12.39	7.87	10.68	7.88	9.34	6.26	3.40	2.41
25th median	5.66	3.91	6.87	5.38	6.61	4.97	2.76	2.41
75th	11.14	7.64	11.87	8.52	9.36	6.37	3.61	3.22

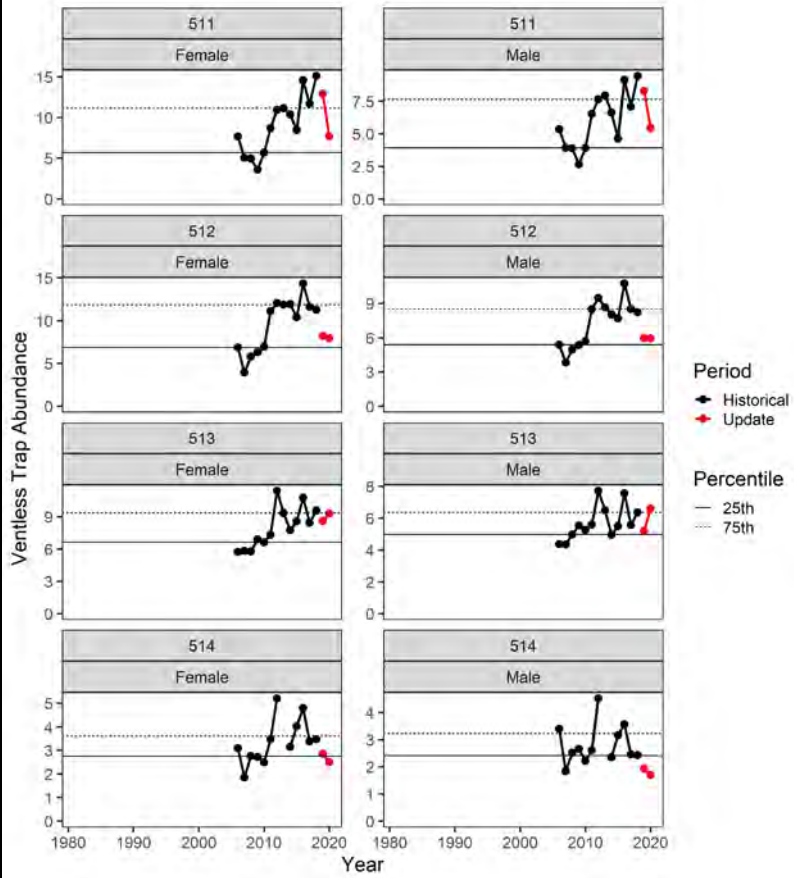


Figure 4. GOM abundance indicators: ventless trap survey abundance.

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Table 5. GBK abundance indicators: trawl survey recruit abundance.

RECRUIT ABUNDANCE (SURVEY)		
Abundance of lobsters 71 - 80 mm CL (sexes combined)		
Survey	NEFSC	
	Spring	Fall
1981	0.08	0.28
1982	0.18	0.41
1983	0.16	0.33
1984	0.09	0.40
1985	0.19	0.26
1986	0.57	0.64
1987	0.43	0.54
1988	0.09	0.36
1989	0.04	0.23
1990	0.44	0.47
1991	0.08	0.34
1992	0.13	0.62
1993	0.50	0.22
1994	0.01	0.13
1995	0.03	0.14
1996	0.00	0.35
1997	0.06	0.90
1998	0.01	0.33
1999	0.07	0.29
2000	0.27	0.33
2001	0.47	0.45
2002	0.06	0.56
2003	0.29	0.16
2004	0.04	0.18
2005	0.09	0.13
2006	0.16	0.12
2007	0.03	0.23
2008	0.05	0.17
2009	0.30	0.33
2010	0.30	0.15
2011	0.09	0.35
2012	0.15	0.17
2013	0.14	0.24
2014	0.16	0.21
2015	0.06	0.44
2016	0.15	0.13
2017	0.35	
2018	0.04	0.22
2014-2018 mean	0.15	0.25
2019	0.16	0.13
2020		
2016-2020 mean	0.17	0.16
25th	0.06	0.18
median	0.11	0.29
75th	0.25	0.40

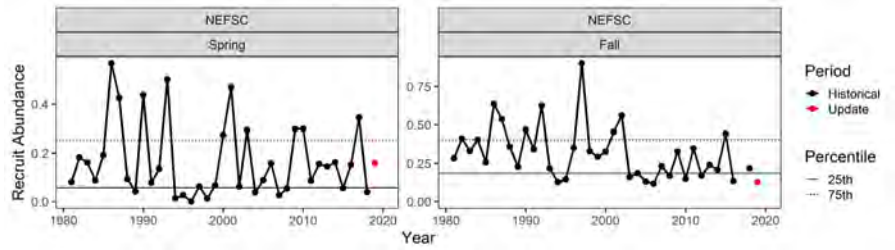


Figure 5. GBK abundance indicators: trawl survey recruit abundance.

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Table 6. GBK abundance indicators: trawl survey encounter rate.

SURVEY LOBSTER ENCOUNTER RATE		
Proportion of positive tows		
Survey	NEFSC	
	Spring	Fall
1981	0.23	0.52
1982	0.23	0.43
1983	0.18	0.38
1984	0.12	0.34
1985	0.19	0.35
1986	0.27	0.36
1987	0.18	0.35
1988	0.34	0.40
1989	0.14	0.38
1990	0.18	0.44
1991	0.19	0.45
1992	0.26	0.49
1993	0.22	0.36
1994	0.11	0.38
1995	0.14	0.42
1996	0.16	0.40
1997	0.10	0.48
1998	0.10	0.40
1999	0.16	0.58
2000	0.23	0.41
2001	0.23	0.49
2002	0.29	0.55
2003	0.27	0.44
2004	0.18	0.53
2005	0.16	0.58
2006	0.24	0.54
2007	0.26	0.46
2008	0.29	0.55
2009	0.34	0.54
2010	0.38	0.62
2011	0.30	0.69
2012	0.35	0.57
2013	0.33	0.65
2014	0.37	0.61
2015	0.27	0.59
2016	0.45	0.55
2017	0.40	
2018	0.29	0.59
2014-2018 mean	0.36	0.58
2019	0.36	0.57
2020		
2016-2020 mean	0.37	0.57
25th median	0.18	0.40
	0.23	0.48
75th	0.29	0.55

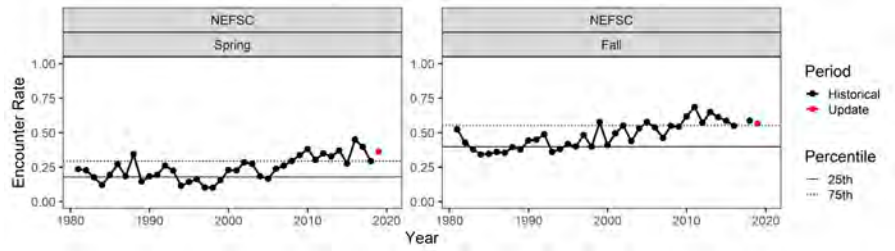


Figure 6. GBK abundance indicators: trawl survey encounter rate.

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Appendix B. Analysis of alternate minimum and maximum sizes as management options for Lobster Management Areas in the Gulf of Maine. Report to the ASFMC Lobster TC and PDT.

Burton Shank and Jeff Kipp

Sept. 9, 2021

The Lobster TC provided analysis to the ASFMC Lobster Board ahead of the Spring 2021 meeting with estimated outcomes to the Gulf of Maine / Georges Bank lobster fishery given the implementation of alternative management measures (min and max gauge size), including changes to total weight of lobsters landed, number of lobsters landed, Spawning Stock Biomass (SSB) and Exploitation. The analysis included an attempt to examine how fisheries in different LCMAs would be affected though the population simulation model was not re-parameterized for each LCMA. In discussions, we concluded that the simulations for LCMA1 were probably reasonably accurate because:

1. Many of the inputs for the simulations are taken from the 2020 stock assessment. Because the vast majority of the landings come from LCMA1, the stock assessment parameters are essentially already tuned to the parameters of the LCMA1 fishery.
2. LCMA1 is primarily a recruitment-based fishery in inshore or nearshore habitats and, therefore, likely to be representative of the full stock model.

However, there was concern that the offshore fishery in Lobster Management Area 3 was considerably different from the full stock model and, thus, may have inaccurate outcomes due to a mis-parameterized simulation model. The parameters for the Outer Cape Cod fishery are probably somewhere between LCMA1 and LCMA3 as it consists of both a resident lobster population and a seasonally-migrating population, moving between inshore and offshore habitats.

To address these differences between the LCMAs in population simulations, we performed the following:

1. For the LCMA1 simulations, we used the stock assessment parameters as the inputs.
2. For LCMA3 simulations, we attempted to manually tune the population simulation model to match the catch characteristics of the LCMA3 fishery, under the assumption that a simulation model that could reproduce the catch characteristics of the fishery may more accurately project changes in the fishery given changing management measures.
3. For the OCC simulations, we ran two sets of simulations, using the input parameters for both LCMA1 and LCMA3 under the assumption that this bounds the dynamics we might see in OCC.

For all simulations, populations were initiated with zero abundance and run for 50 years with constant recruitment to allow population abundances and length comps to reach equilibrium.

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The equilibrium populations were then compared across the various legal selectivity scenarios to determine the effect of these different management alternatives.

For a simple, model-free analysis of the fishery catch composition for LCMA1 and LCMA3, we calculated the cumulative proportion of catch by weight at length by converting catch-at-size to weight-at-size and weighting for unequal sex ratios and seasonality of landings.

LCMA1 Simulations

The input parameters for the LCMA1 simulations were primarily drawn from the 2020 stock assessment. This includes the recruitment seasonality, length composition and sex ratio, growth model, gear, legal and conservation selectivities and mean estimated fishing mortality from the terminal years.

LCMA1 Results

The cumulative catch weight-by-length curve indicates that the mean size of lobsters landed in the LCMA1 fishery is within the smallest legal size bin (83-91mm, Figure 1). Nearly 90% of the catch are below 100mm CL and only about 2% of the catch are over 120mm CL. This supports the perspective that LCMA1 landings involve a narrow range of small lobster sizes and is primarily a recruitment-dependent fishery.

Increasing the minimum legal size is projected to decrease the total number of lobsters landed but result in a net increase in yield-per-recruit (YPR) and total weight of catch (Table 1 and 2). However, the magnitude of these changes are small enough that they may not be detectable in the actual fishery given inter-annual variations in recruitment and catch. Changing the maximum legal size is projected to have very little effect on either catch number or weight.

Note that these are purely yield-per-recruit simulations so recruitment subsidies from increased SSB are not assumed in the calculations of catch weight or number so, thus, probably represent a conservative, lower bound. A less conservative upper bound would be the product of change in YPR and the change in SSB.

Increasing the minimum legal size is projected to result in large increases in SSB (Table 3). Minimum legal sizes that approach or exceed the size of maturity produce increasing returns on SSB as this allows a much larger portion of the population to reproduce at least once. Thus, increasing minimum legal size to 88mm is projected to result in a near doubling in SSB. Increasing maximum size can result in a large decrease SSB, particularly as the minimum legal size increases and more of the population survives to reach the current maximum legal size.

Increasing legal size would result in moderate to large decreases in exploitation as more of the stock becomes protected (Table 4) with exploitation decreasing by nearly 30% at a minimum legal size of 88mm. As with catch weight and number, changing maximum legal size has little effect on exploitation rates as these sizes represent a very small portion of the LCMA1 population.

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LCMA3 Simulations

We first analyzed the port and sea sampling data provided for the 2020 benchmark assessment but constrained to LCMA3 to estimate fishery characteristics, including catch size composition, catch sex ratio, and conservation selectivity (discarding due to egg-bearing or V-notch status).

We then specified the conservation selectivity from the biosamples and current legal selectivity appropriate for LCMA3 in the population simulation model and iteratively tuned the following parameters:

1. Fully-selected fishing mortality, assumed constant across seasons
2. Recruitment sex ratio
3. Recruitment size composition for each sex.

For a given tuning run, the population simulation model was provided an updated set of input parameters and projected forward 25 year to reach equilibrium. The resulting catch composition from the model run was then compared to the average catch composition from the last five years of the biosamples to determine accuracy of the simulation models. Comparisons were conducted both visually for obvious lack-of-fit and by correlating the simulated and observed catch compositions. Correlations were performed on both the catch proportions and logit-transformed catch proportions, the latter to place more emphasis on length compositions that occur in smaller proportions.

Once the model was tuned to perform as well as might be expected, given minor, seasonal lack-of-fit that could not be easily resolved, the simulation model was then run with the tuned parameters for all combinations of proposed minimum and maximum size limits. We then summarized the outputs from the different simulations as values relative to the current minimum and maximum size regulations in place for LCMA3.

Results

The cumulative catch weight-by-length curve indicates that 110 mm carapace length is the approximate mean size of lobsters landed in the LCMA3 fishery (Figure 1). However, the cumulative curve is nearly linear from 90mm through 130mm, indicating lobsters across this size range are about equally important to the landings of this fishery. Lobsters less than about 92mm constitute the lower 10% quantile of landings while lobsters greater than 136mm constitute the upper 10% quantile with lower and upper quartiles around 98mm and 123mm respectively. This suggests that LCMA3 landings include a broad range of lobster sizes, unlike typical inshore lobster fisheries that are primarily recruitment-driven.

The final tuned parameters included a quarterly fishing mortality of 0.1 (0.4 total annual mortality) and a 70:30 female to male recruitment sex ratio. The tuned recruit length compositions are bi-modal for both sexes, indicating recruitment to the fishery comes both from growth of smaller individual within the LCMA and immigration from outside the LCMA (Figure 2). With these compositions, about 80% of male recruitment and 30% of female

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recruitment is attributed to growth with the remainder of new individuals coming from immigration from outside the LCMA.

Fitting the simulation length comps by manually tuning these parameters resulted in reasonably good fits to the observed length compositions (Figures 3, 4, and 5). Some lack-of-fit is still evident within seasons but this lack-of-fit is generally contrary to the lack-of-fit observed in other seasons, making it difficult to further improve the fit with just the parameters of interest. Correlations between observed and predicted compositions were 0.981 for simple proportions and 0.97 for logit-transformed proportions, suggesting both high and low proportion values for observed length comps are well matched by the simulation and we deemed this adequate to a basis to examine alternative management options.

Decreasing either the minimum or maximum legal size is projected to decrease total weight of catch (Table 5). However, contrary to the previous analysis for the full stock or inshore LCMA's, changes to the maximum size have much larger impacts on landings than changes to the minimum size, particularly once the maximum size drops to between 140 and 150mm. Decreasing the maximum size from 171mm to 127mm is projected to decrease landings by about 30% while decreasing the minimum size from 90mm to 83mm is only projected to decrease landings by a couple of percent.

Decreasing the minimum legal size is projected to marginally increase the number of lobsters being landed but decreasing the maximum size marginally to moderately decreases the number of lobsters landed, producing neutral effects for many of the management options explored here (Table 6).

Decreasing maximum legal size from current regulations is projected to increase SSB, possibly significantly, but decreasing minimum sizes would decrease SSB (Table 7). The greatest observed increase would be from holding the minimum size at current values but maximally decreasing maximum sizes, essentially narrowing the length range where lobsters are legal, which is estimated to result in a 64% increase in spawning stock. As above, changes to maximum size have bigger effects on SSB than changes to minimum sizes.

Decreasing maximum sizes would result in a decrease in exploitation but decreasing minimum sizes would increase exploitation (Table 8), countering each other and paralleling patterns observed for SSB. Because the calculation of exploitation is based on numbers of individuals rather than mass, decreasing minimum sizes have larger effects on exploitation than observed above for landings or SSB. Again, changes in exploitation increase rapidly with decreasing maximum sizes once the alternate maximum gauge size reaches a size that includes a significant portion of the catch for the LCMA.

OCC Simulations

Due to time and data constraints, we did not attempt to tune a simulation model for OCC. Rather, we assume that population dynamics and fishing mortality rates in OCC are bounded by

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the conditions observed in the LCMA1 and LCMA3 fisheries. Thus, we ran simulations for OCC using the OCC legal size range with both the LCMA1 and LCMA3 parameterizations and present both sets of results with the understanding that results for OCC should fall between these extremes.

In general, outputs (catch weight, number, SSB and exploitation) show different responses for the LCMA1 than the LCMA3 parameterizations. LCMA1 parameterizations tend to produce simulations that are very sensitive to changes in minimum legal size but not maximum legal size, while simulations with LCMA3 parameterization only slightly sensitive to changes in minimum legal size but moderately to highly sensitive to changes in maximum legal size.

Total weight of landings is projected to be sensitive to changing minimum legal size with the LCMA1 parameterization but be insensitive with the LCMA3 parameterization (Table 9 A & B). With the LCMA1 parameterization, decreasing minimum size is projected to decrease landings by ~5% while increasing legal size to 88mm would increase landings by 8%. Conversely, landings weight is insensitive to changes in maximum legal size for the LCMA1 parameterization but sensitive to changes for the LCMA3 parameterization.

Total catch number simulations shows trend similar to catch weight with the LCMA1 parameterization being sensitive to changes in minimum size and the LCMA3 parameterization sensitive to changes in maximum size (Figure 10 A & B). The pattern otherwise holds that larger minimum legal sizes result in lower catch numbers.

For SSB, the LCMA1 parameterization is responsive to both changes in minimum and maximum legal size while the LCMA3 parameterization is more sensitive to changes in maximum size (Figure 11 A & B). For example, decreasing minimum legal size to 127mm would increase SSB by between 24% and 65% for the LCMA1 and LCMA3 parameterizations, respectively. The ranges of minimum size tested in simulations produce changes in SSB in the range of -26% to +76% for the LCMA1 parameterization and -1% to +6.8% for the LCMA3 parameterization.

Decreasing minimum legal size produce increases moderate to small increases in exploitation (16% to 4% for LCMA1 and LCMA3 parameterizations, respectively, Figure 12 A & B). Either increasing minimum legal size or decreasing maximum legal size decrease serve to decrease exploitation with a maximum decrease of ~39% observed at the largest minimum and smallest maximum size and the LCMA3 parameterization.

Discussion

There is a stark difference in cumulative landings by size between LCMA1 and LCMA3. LCMA1 is clearly a recruitment-based fishery that would be highly sensitive to variations in recruitment. The LCMA3 fishery, in contrast, is fishing a broad range of lobster sizes, and therefore ages, and is thus somewhat buffered from interannual variation in recruitment dynamics.

The LCMA1 fishery is highly sensitive to changes in minimum legal size because of high exploitation rates on newly-recruited lobsters. The range of minimum sizes tested in

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simulations encompasses size range that represents the majority of landings for the inshore / nearshore fishery. Thus, changes to minimum size would dramatically change the length composition of the catch. Increases in the minimum size will have temporarily but significantly depress landing in the years immediately after are implemented but the benefits to SSB would be similarly immediate. Increasing the minimum legal size can add to the resilience of the fishery by marginally increasing the spread of effort across multiple year classes and significantly increasing SSB and egg production which may buffer the effects in any future change in productivity.

Generally, decreasing maximum gauge sizes have larger effects for LCMA3 both relative to decreasing minimum sizes in LCMA3 or for changing maximum sizes for the other LCMAs. This matches the conclusions based on the cumulative catch curve (Figure 1) that showed that the LCMA3 fishery lands a much broader size range of individuals than the inshore LCMAs, with the upper portion of length compositions overlapping proposed alternative maximum sizes.

This analysis for LCMA3 matches previous analysis conducted for inshore LCMAs, finding that larger minimum legal sizes had positive effects across population parameters including higher catch weights, increased SSB and decreased exploitation. However, decreasing maximum legal sizes has mixed effects, decreasing immediate landings but increasing SSB, potentially by a larger margin. Because recruitment subsidies from increasing SSB are not included in this simulation, the net effect of these two opposing changes are uncertain. While decreasing maximum legal sizes would decrease immediate landings and make a larger portion of the population inaccessible to the fishery permanently (i.e. excluded lobsters won't grow into a legal size in the future), this increase in SSB may eventually produce a recruitment subsidy that could offset this loss of catch. The net effect would depend on multiple factors including the connectivity of the added SSB to larval settlement habitat and the migration patterns of these large females into adjacent habitats including inshore Gulf of Maine and international waters.

Finally, it is important to note the importance of large female lobsters that dominate the landings for much of LCMA3. This both highlights the partial dependence of this fishery on immigration from adjacent habitats and adds uncertainty to this analysis. The growth and molt cycling of such large females is poorly understood and are not particularly well informed in the current growth model. Thus, the tuned parameters may be biased by mis-specification of the growth model and results in this analysis may be sensitive to the growth model used in some cases. Interpretation of tuned parameters and confidence in the precise results of this analysis should be taken with some caution. However, the general patterns of changing catch, SSB and exploitation with changes in minimum and maximum legal sizes is consistent across this and previous analyses so may be treated with higher confidence.

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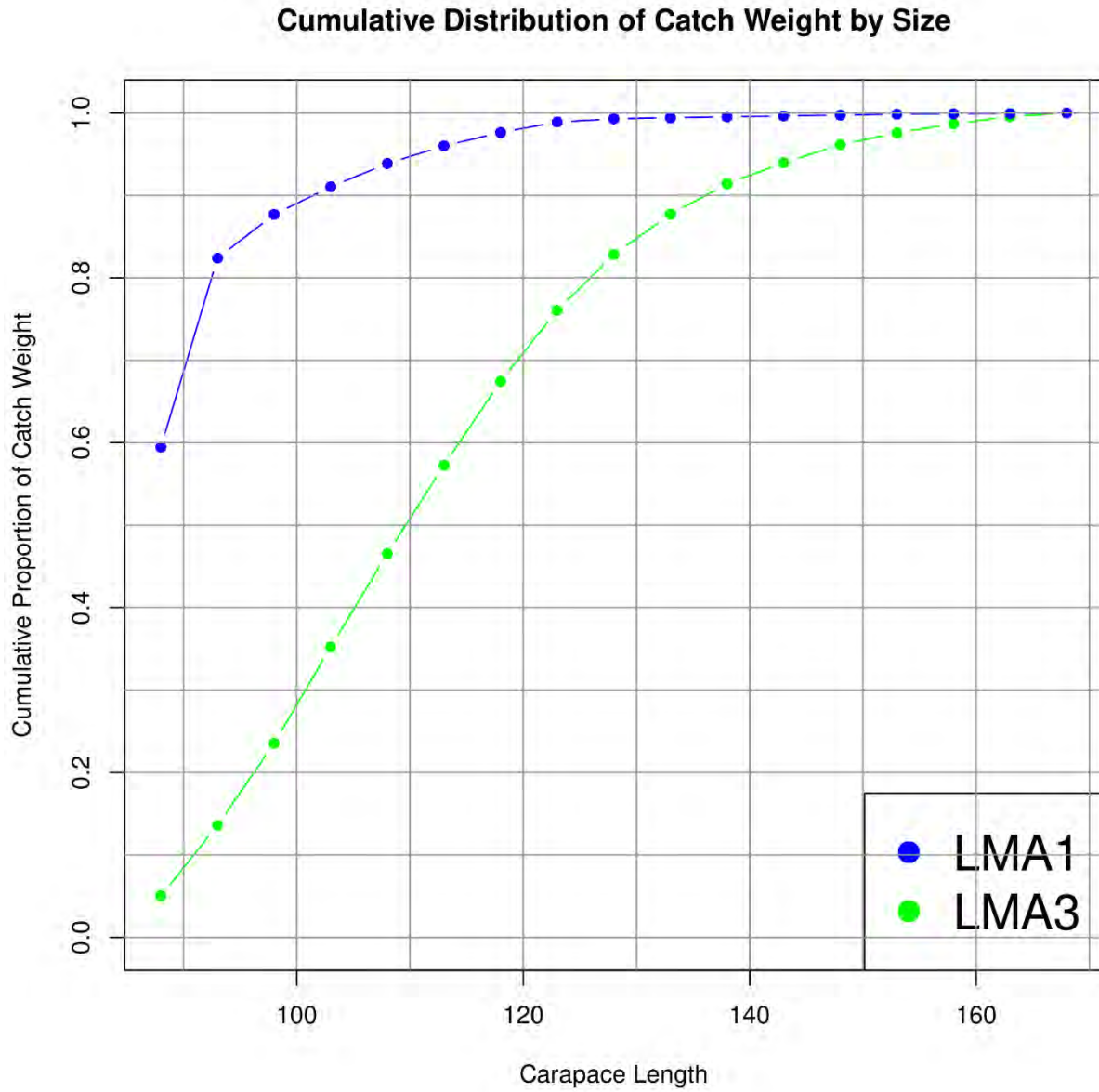


Figure 1. Cumulative proportion of catch weight by carapace length. To interpret, lobsters less than 90mm constitute approximately 8% of landings, while lobsters less than 130mm constitute approximately 85% of landings.

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Recruit proportions for tuned population model

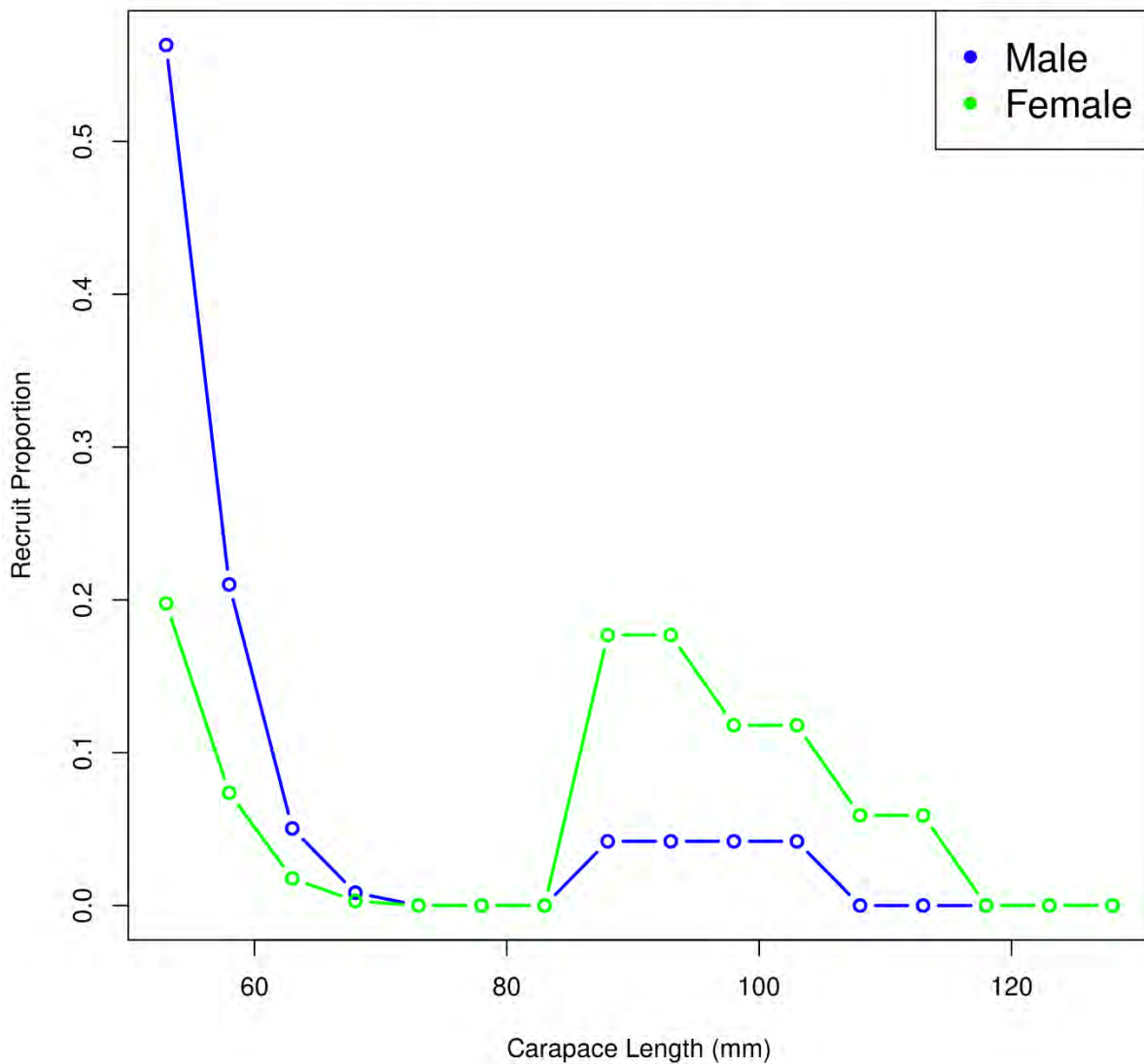


Figure 2. Tuned recruitment length compositions for the fitted model. The bi-modal length distribution suggests a combination of recruitment by growth (individuals <70mm) and migration (individuals >85 mm) with males primarily recruiting by growth and females primarily recruiting by migration as mature adults.

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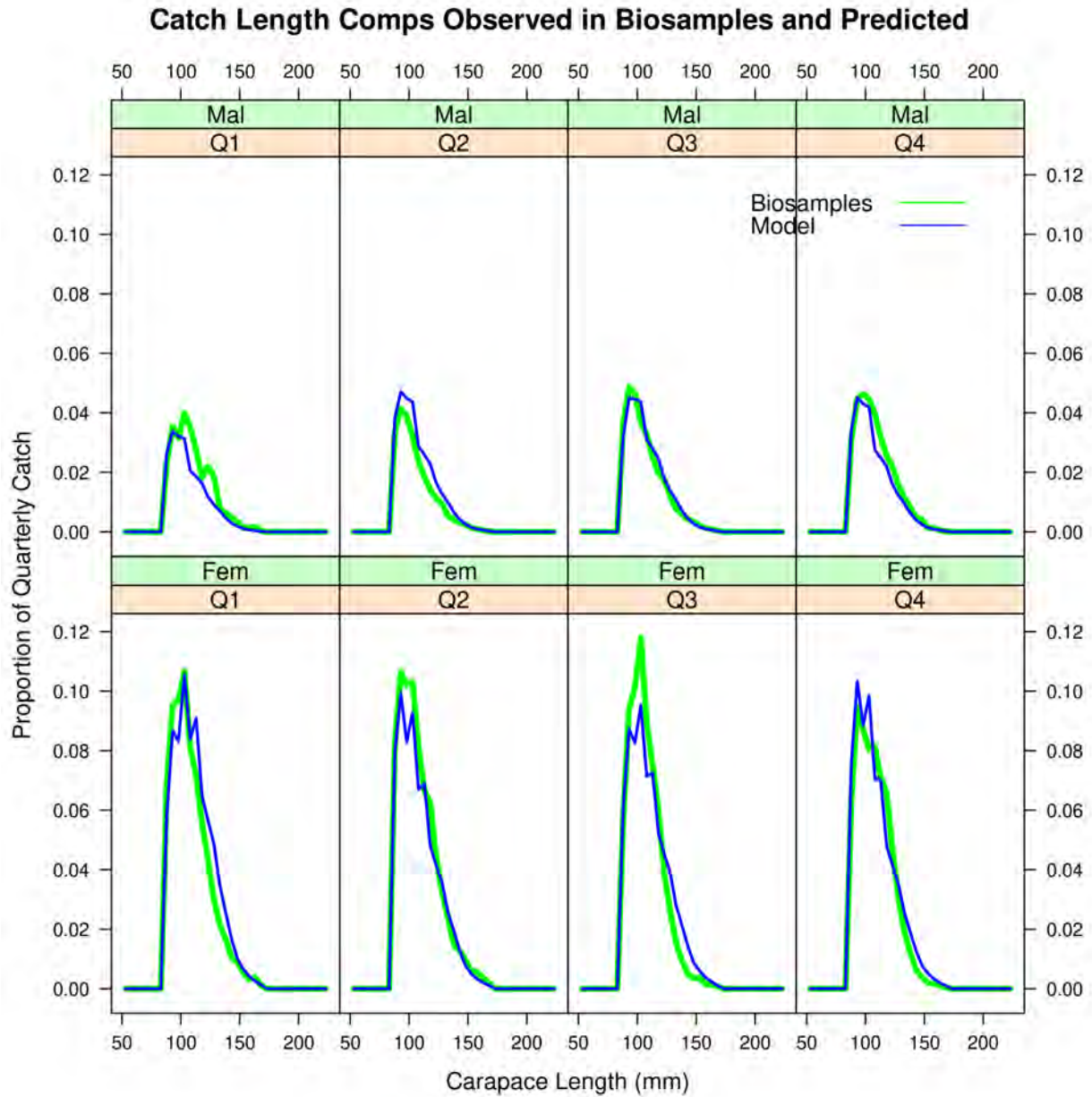


Figure 3. LCMA 3 catch length compositions by sex and quarter based on biosampling and from the tuned population model.

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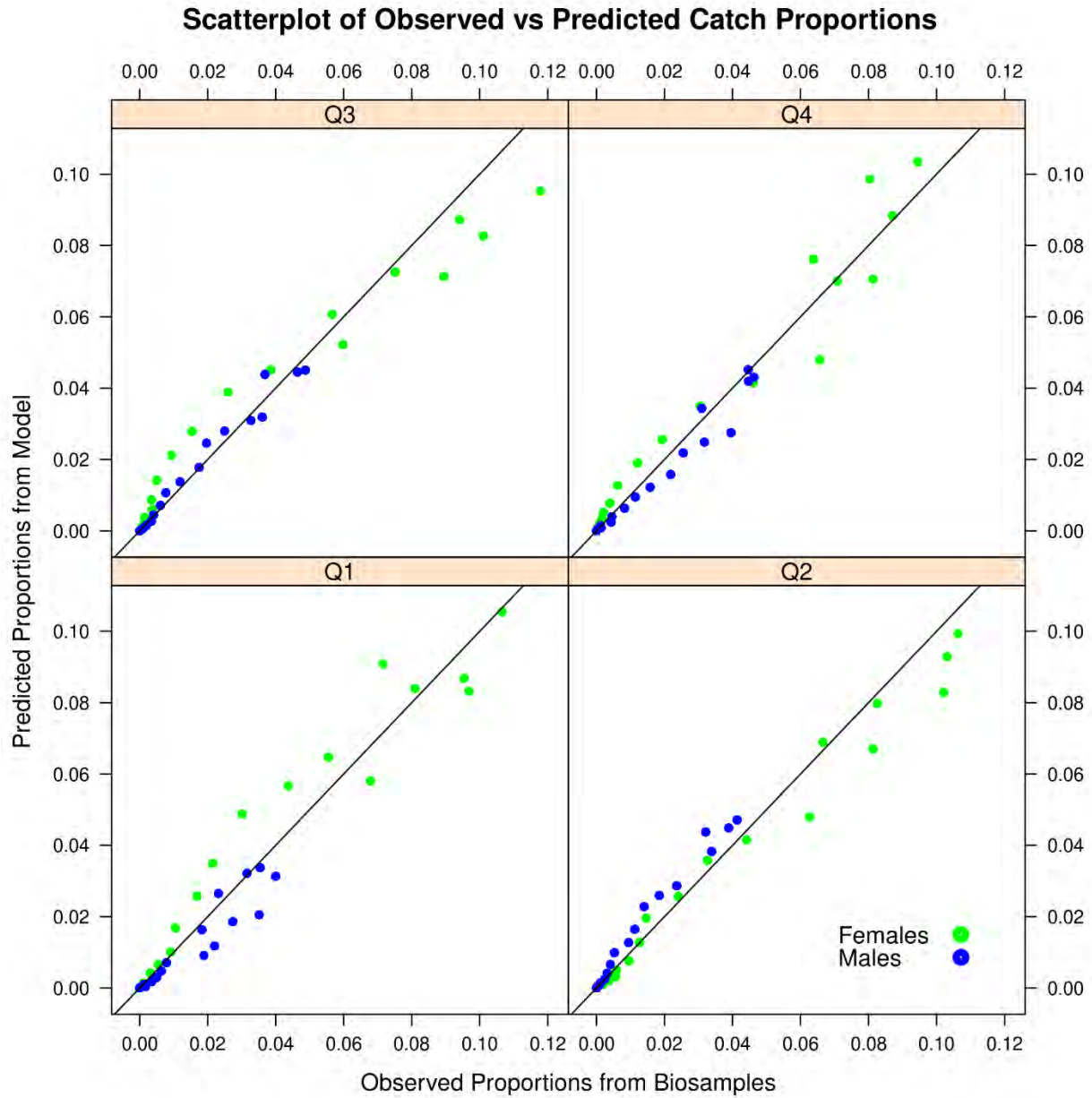


Figure 4. Relationship between length composition proportions observed in biosamples and predicted in the tuned population model by quarter and sex. The diagonal 1:1 line shows an ideal fit between the data sets.

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Scatterplot of Observed vs Predicted Catch Proportions in Logit space

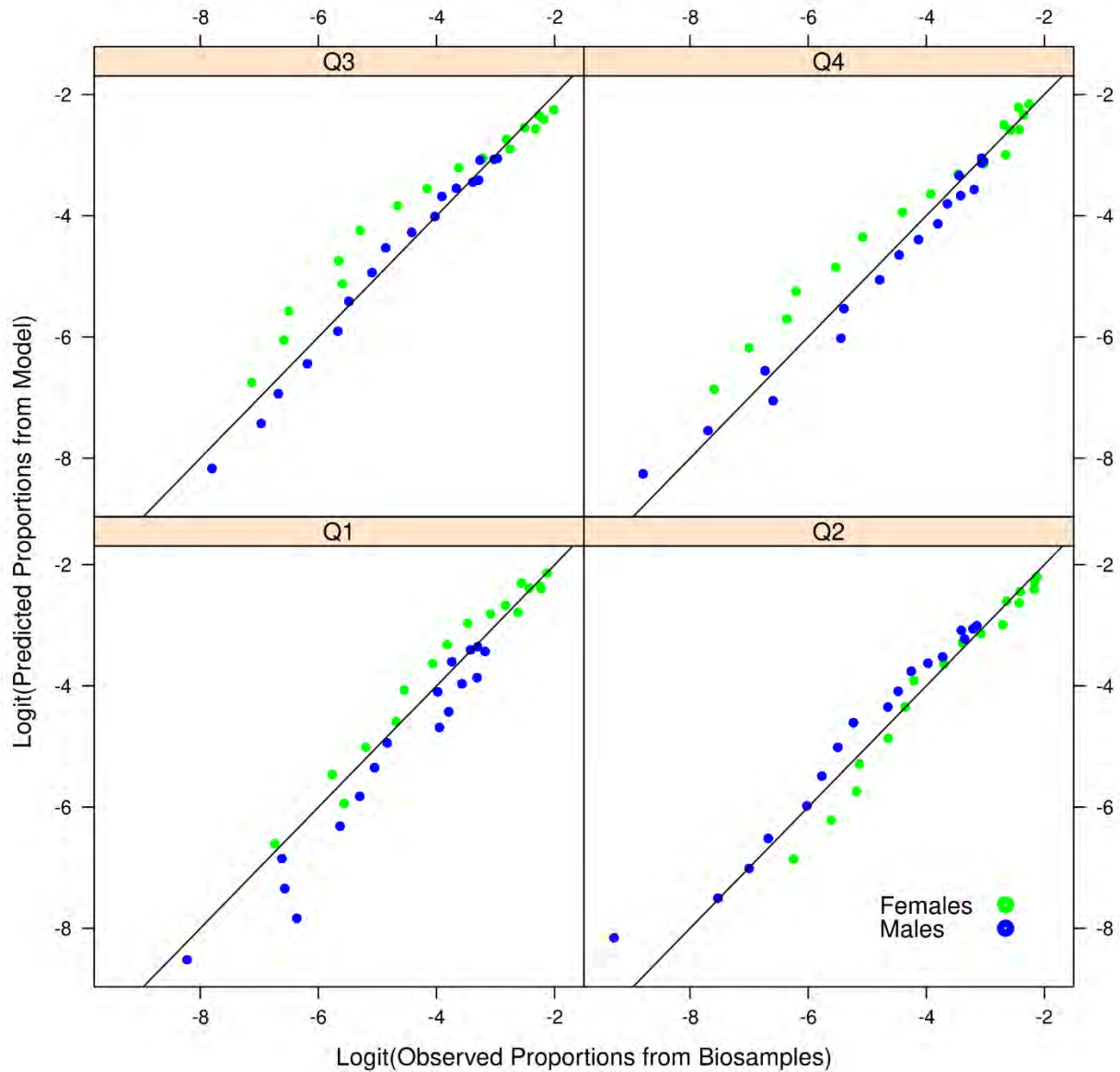


Figure 5. Relationship between length composition proportions observed in biosamples and predicted in the tuned population model by quarter and sex. Data points are logit-transformed to emphasize fit to lengths that occur in low proportions. The diagonal 1:1 line shows an ideal fit between the data sets.

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Table 1. LCMA1 projected relative changes to Weight of Landings resulting from alternative minimum and maximum options, relative to the current regulations (yellow cell).

		Maximum Gauge Size						
		5in / 127mm	5.5in / 140mm	6in / 152mm	6.25in / 159mm	6.5in / 165mm	6.75in / 171mm	None
Minimum Gauge Size	3.25in / 83mm	0.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%
	3.31in / 84mm	3.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%
	3.38in / 86mm	5.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%
	3.47in / 88mm	13.00%	14.00%	14.00%	14.00%	14.00%	14.00%	14.00%
	3.53in / 90mm	14.00%	15.00%	15.00%	15.00%	15.00%	15.00%	15.00%
	3.594in / 91mm	16.00%	18.00%	18.00%	18.00%	18.00%	18.00%	18.00%

Table 2. LCMA1 projected relative changes to Number of lobsters Landed resulting from alternative minimum and maximum options, relative to the current regulations (yellow cell).

		Maximum Gauge Size						
		5in / 127mm	5.5in / 140mm	6in / 152mm	6.25in / 159mm	6.5in / 165mm	6.75in / 171mm	None
Minimum Gauge Size	3.25in / 83mm	0.00%	0.20%	0.20%	0.20%	0.20%	0.20%	0.20%
	3.31in / 84mm	-2.00%	-1.80%	-1.80%	-1.80%	-1.80%	-1.80%	-1.80%
	3.38in / 86mm	-3.60%	-3.30%	-3.30%	-3.30%	-3.30%	-3.30%	-3.30%
	3.47in / 88mm	-8.50%	-8.10%	-8.00%	-8.00%	-8.00%	-8.00%	-8.00%
	3.53in / 90mm	-9.50%	-9.00%	-9.00%	-9.00%	-9.00%	-9.00%	-9.00%
	3.594in / 91mm	-11.30%	-10.80%	-10.70%	-10.70%	-10.70%	-10.70%	-10.70%

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Table 3. LCMA1 projected relative changes to Spawning Stock Biomass resulting from alternative minimum and maximum options, relative to the current regulations (yellow cell).

		Maximum Gauge Size						
		5in / 127mm	5.5in / 140mm	6in / 152mm	6.25in / 159mm	6.5in / 165mm	6.75in / 171mm	None
Minimum Gauge Size	3.25in / 83mm	0.00%	-16.50%	-18.30%	-18.50%	-18.50%	-18.60%	-18.60%
	3.31in / 84mm	19.00%	-1.40%	-3.60%	-3.80%	-3.90%	-3.90%	-3.90%
	3.38in / 86mm	38.00%	13.90%	11.30%	11.00%	10.90%	10.90%	10.90%
	3.47in / 88mm	98.00%	61.00%	56.90%	56.60%	56.50%	56.40%	56.40%
	3.53in / 90mm	117.00%	75.80%	71.30%	70.90%	70.70%	70.70%	70.70%
	3.594in / 91mm	151.00%	101.70%	96.40%	95.90%	95.70%	95.70%	95.60%

Table 4. LCMA1 projected relative changes to Exploitation resulting from alternative minimum and maximum options, relative to the current regulations (yellow cell).

		Maximum Gauge Size						
		5in / 127mm	5.5in / 140mm	6in / 152mm	6.25in / 159mm	6.5in / 165mm	6.75in / 171mm	None
Minimum Gauge Size	3.25in / 83mm	0.00%	0.80%	0.80%	0.80%	0.80%	0.80%	0.80%
	3.31in / 84mm	-8.50%	-7.70%	-7.60%	-7.60%	-7.60%	-7.60%	-7.60%
	3.38in / 86mm	-14.40%	-13.60%	-13.50%	-13.50%	-13.50%	-13.50%	-13.50%
	3.47in / 88mm	-29.40%	-28.40%	-28.30%	-28.30%	-28.30%	-28.30%	-28.30%
	3.53in / 90mm	-32.10%	-31.00%	-30.90%	-30.90%	-30.90%	-30.90%	-30.90%
	3.594in / 91mm	-36.50%	-35.40%	-35.30%	-35.20%	-35.20%	-35.20%	-35.20%

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Table 5. LCMA3 projected relative changes to Weight of Landings resulting from alternative minimum and maximum options, relative to the current regulations (yellow cell).

		Maximum Gauge Size						
		5in / 127mm	5.5in / 140mm	6in / 152mm	6.25in / 159mm	6.5in / 165mm	6.75in / 171mm	None
Minimum Gauge Size	3.25in / 83mm	-31.30%	-14.60%	-6.30%	-4.20%	-2.80%	-2.10%	-0.80%
	3.31in / 84mm	-31.20%	-14.30%	-6.00%	-3.80%	-2.40%	-1.60%	-0.40%
	3.38in / 86mm	-31.20%	-14.00%	-5.60%	-3.40%	-2.00%	-1.20%	0.00%
	3.47in / 88mm	-31.10%	-13.60%	-5.00%	-2.70%	-1.30%	-0.50%	0.80%
	3.53in / 90mm	-31.40%	-13.40%	-4.60%	-2.30%	-0.90%	0.00%	1.30%
	3.594in / 91mm	-31.70%	-13.20%	-4.10%	-1.70%	-0.30%	0.60%	1.90%

Table 6. LCMA3 projected relative changes to Number of lobsters Landed resulting from alternative minimum and maximum options, relative to the current regulations (yellow cell).

		Maximum Gauge Size						
		5in / 127mm	5.5in / 140mm	6in / 152mm	6.25in / 159mm	6.5in / 165mm	6.75in / 171mm	None
Minimum Gauge Size	3.25in / 83mm	-11.10%	-0.80%	3.20%	4.00%	4.50%	4.70%	5.00%
	3.31in / 84mm	-12.20%	-1.70%	2.30%	3.20%	3.70%	3.90%	4.20%
	3.38in / 86mm	-13.20%	-2.60%	1.50%	2.30%	2.80%	3.10%	3.40%
	3.47in / 88mm	-15.20%	-4.20%	-0.10%	0.80%	1.30%	1.50%	1.80%
	3.53in / 90mm	-17.10%	-5.90%	-1.70%	-0.80%	-0.30%	0.00%	0.30%
	3.594in / 91mm	-19.50%	-7.90%	-3.60%	-2.60%	-2.10%	-1.90%	-1.50%

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Table 7. LCMA3 projected relative changes to Spawning Stock Biomass resulting from alternative minimum and maximum options, relative to the current regulations (yellow cell).

		Maximum Gauge Size						None
		5in / 127mm	5.5in / 140mm	6in / 152mm	6.25in / 159mm	6.5in / 165mm	6.75in / 171mm	
Minimum Gauge Size	3.25in / 83mm	56.00%	19.00%	3.00%	-1.50%	-3.80%	-5.20%	-6.90%
	3.31in / 84mm	57.00%	20.00%	3.00%	-0.80%	-3.10%	-4.50%	-6.20%
	3.38in / 86mm	59.00%	21.00%	4.00%	0.00%	-2.40%	-3.70%	-5.50%
	3.47in / 88mm	61.00%	23.00%	6.00%	1.50%	-0.90%	-2.30%	-4.10%
	3.53in / 90mm	64.00%	25.00%	8.00%	3.80%	1.40%	0.00%	-1.80%
	3.594in / 91mm	69.00%	29.00%	11.00%	6.70%	4.20%	2.80%	1.00%

Table 8. LCMA3 projected relative changes to Exploitation resulting from alternative minimum and maximum options, relative to the current regulations (yellow cell).

		Maximum Gauge Size						None
		5in / 127mm	5.5in / 140mm	6in / 152mm	6.25in / 159mm	6.5in / 165mm	6.75in / 171mm	
Minimum Gauge Size	3.25in / 83mm	-20.40%	-0.30%	8.40%	10.30%	11.40%	11.90%	12.50%
	3.31in / 84mm	-22.30%	-2.40%	6.30%	8.10%	9.20%	9.70%	10.30%
	3.38in / 86mm	-24.10%	-4.40%	4.10%	6.00%	7.00%	7.50%	8.10%
	3.47in / 88mm	-27.40%	-8.10%	0.30%	2.20%	3.10%	3.70%	4.30%
	3.53in / 90mm	-30.60%	-11.60%	-3.30%	-1.50%	-0.50%	0.00%	0.60%
	3.594in / 91mm	-34.20%	-15.60%	-7.50%	-5.70%	-4.80%	-4.20%	-3.70%

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Table 9. OCC projected relative changes to Weight of Landings resulting from alternative minimum and maximum options, relative to the current regulations (yellow cell), based on (A) LCMA1 or (B) LCMA3 parameterizations.

A.

		Maximum Gauge Size						None
		5in / 127mm	5.5in / 140mm	6in / 152mm	6.25in / 159mm	6.5in / 165mm	6.75in / 171mm	
Minimum Gauge Size	3.25in / 83mm	-5.60%	-5.00%	-4.90%	-4.90%	-4.90%	-4.90%	-4.90%
	3.31in / 84mm	-2.70%	-2.00%	-1.90%	-1.90%	-1.90%	-1.90%	-1.90%
	3.38in / 86mm	-0.90%	-0.10%	0.00%	0.00%	0.00%	0.00%	0.00%
	3.47in / 88mm	6.60%	7.80%	8.00%	8.00%	8.00%	8.00%	8.00%
	3.53in / 90mm	7.40%	8.80%	8.90%	8.90%	8.90%	8.90%	8.90%
	3.594in / 91mm	9.30%	11.00%	11.20%	11.20%	11.20%	11.20%	11.20%

B.

		Maximum Gauge Size						None
		5in / 127mm	5.5in / 140mm	6in / 152mm	6.25in / 159mm	6.5in / 165mm	6.75in / 171mm	
Minimum Gauge Size	3.25in / 83mm	-30.40%	-13.50%	-5.20%	-3.00%	-1.60%	-0.80%	0.00%
	3.31in / 84mm	-30.30%	-13.20%	-4.80%	-2.60%	-1.20%	-0.40%	1.00%
	3.38in / 86mm	-30.30%	-13.00%	-4.40%	-2.20%	-0.80%	0.00%	1.00%
	3.47in / 88mm	-30.30%	-12.50%	-3.80%	-1.50%	-0.10%	0.70%	2.00%
	3.53in / 90mm	-30.60%	-12.40%	-3.40%	-1.10%	0.40%	1.20%	3.00%
	3.594in / 91mm	-30.90%	-12.10%	-2.90%	-0.50%	1.00%	1.90%	3.00%

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Table 10. OCC projected relative changes to Number of lobsters Landed resulting from alternative minimum and maximum options, relative to the current regulations (yellow cell), based on (A) LCMA1 or (B) LCMA3 parameterizations.

A.

		Maximum Gauge Size						
		5in / 127mm	5.5in / 140mm	6in / 152mm	6.25in / 159mm	6.5in / 165mm	6.75in / 171mm	None
Minimum Gauge Size	3.25in / 83mm	3.40%	3.60%	3.60%	3.60%	3.60%	3.60%	3.60%
	3.31in / 84mm	1.30%	1.60%	1.60%	1.60%	1.60%	1.60%	1.60%
	3.38in / 86mm	-0.30%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	3.47in / 88mm	-5.40%	-4.90%	-4.90%	-4.90%	-4.90%	-4.90%	-4.90%
	3.53in / 90mm	-6.40%	-5.90%	-5.90%	-5.90%	-5.90%	-5.90%	-5.90%
	3.594in / 91mm	-8.30%	-7.70%	-7.70%	-7.70%	-7.70%	-7.70%	-7.70%

B.

		Maximum Gauge Size						
		5in / 127mm	5.5in / 140mm	6in / 152mm	6.25in / 159mm	6.5in / 165mm	6.75in / 171mm	None
Minimum Gauge Size	3.25in / 83mm	-13.80%	-3.70%	0.10%	0.90%	1.40%	1.60%	1.90%
	3.31in / 84mm	-14.80%	-4.60%	-0.70%	0.10%	0.60%	0.80%	1.10%
	3.38in / 86mm	-15.80%	-5.50%	-1.50%	-0.70%	-0.20%	0.00%	0.30%
	3.47in / 88mm	-17.70%	-7.10%	-3.10%	-2.20%	-1.70%	-1.50%	-1.20%
	3.53in / 90mm	-19.60%	-8.70%	-4.60%	-3.70%	-3.20%	-3.00%	-2.70%
	3.594in / 91mm	-21.90%	-10.70%	-6.40%	-5.50%	-5.00%	-4.80%	-4.50%

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Table 11. OCC projected relative changes to Spawning Stock Biomass resulting from alternative minimum and maximum options, relative to the current regulations (yellow cell), based on (A) LCMA1 or (B) LCMA3 parameterizations.

A.

		Maximum Gauge Size						
		5in / 127mm	5.5in / 140mm	6in / 152mm	6.25in / 159mm	6.5in / 165mm	6.75in / 171mm	None
Minimum Gauge Size	3.25in / 83mm	-9.80%	-24.70%	-26.40%	-26.50%	-26.60%	-26.60%	-26.60%
	3.31in / 84mm	7.00%	-11.10%	-13.10%	-13.30%	-13.30%	-13.30%	-13.30%
	3.38in / 86mm	24.30%	2.70%	0.30%	0.10%	0.00%	0.00%	0.00%
	3.47in / 88mm	78.20%	45.10%	41.50%	41.20%	41.10%	41.00%	41.00%
	3.53in / 90mm	95.50%	58.50%	54.40%	54.00%	53.90%	53.90%	53.90%
	3.594in / 91mm	126.20%	81.80%	77.00%	76.60%	76.50%	76.40%	76.40%

B.

		Maximum Gauge Size						
		5in / 127mm	5.5in / 140mm	6in / 152mm	6.25in / 159mm	6.5in / 165mm	6.75in / 171mm	None
Minimum Gauge Size	3.25in / 83mm	63.00%	24.00%	7.00%	2.00%	-0.10%	-1.50%	-3.30%
	3.31in / 84mm	64.00%	25.00%	7.00%	3.00%	0.60%	-0.70%	-2.60%
	3.38in / 86mm	65.00%	26.00%	8.00%	4.00%	1.40%	0.00%	-1.80%
	3.47in / 88mm	67.00%	27.00%	10.00%	5.00%	2.90%	1.50%	-0.30%
	3.53in / 90mm	71.00%	30.00%	12.00%	8.00%	5.30%	3.90%	2.00%
	3.594in / 91mm	75.00%	34.00%	15.00%	11.00%	8.30%	6.80%	4.90%

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Table 12. OCC projected relative changes to Exploitation resulting from alternative minimum and maximum options, relative to the current regulations (yellow cell), based on (A) LCMA1 or (B) LCMA3 parameterizations.

A.

		Maximum Gauge Size						None
		5in / 127mm	5.5in / 140mm	6in / 152mm	6.25in / 159mm	6.5in / 165mm	6.75in / 171mm	
Minimum Gauge Size	3.25in / 83mm	15.60%	16.50%	16.50%	16.50%	16.50%	16.50%	16.50%
	3.31in / 84mm	5.80%	6.70%	6.80%	6.80%	6.80%	6.80%	6.80%
	3.38in / 86mm	-1.10%	-0.10%	0.00%	0.00%	0.00%	0.00%	0.00%
	3.47in / 88mm	-18.40%	-17.30%	-17.10%	-17.10%	-17.10%	-17.10%	-17.10%
	3.53in / 90mm	-21.50%	-20.20%	-20.10%	-20.10%	-20.10%	-20.10%	-20.10%
	3.594in / 91mm	-26.70%	-25.30%	-25.20%	-25.20%	-25.20%	-25.20%	-25.20%

B.

		Maximum Gauge Size						None
		5in / 127mm	5.5in / 140mm	6in / 152mm	6.25in / 159mm	6.5in / 165mm	6.75in / 171mm	
Minimum Gauge Size	3.25in / 83mm	-26.00%	-7.30%	0.80%	2.60%	3.60%	4.10%	4.60%
	3.31in / 84mm	-27.70%	-9.20%	-1.20%	0.60%	1.50%	2.00%	2.60%
	3.38in / 86mm	-29.40%	-11.10%	-3.20%	-1.40%	-0.50%	0.00%	0.60%
	3.47in / 88mm	-32.50%	-14.50%	-6.70%	-5.00%	-4.10%	-3.60%	-3.00%
	3.53in / 90mm	-35.40%	-17.70%	-10.00%	-8.40%	-7.50%	-7.00%	-6.50%
	3.594in / 91mm	-38.80%	-21.50%	-13.90%	-12.30%	-11.40%	-10.90%	-10.40%

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Appendix C. Trigger Mechanism Analysis and Recommendation

Recruit (71-80 mm carapace length) indices are used as model-free indicators of recruitment to the lobster fishery in the following year. During the 2020 stock assessment, recruit indicators were found to be correlated with the stock assessment model estimates of reference abundance (78+ mm carapace length), providing a reliable means to track abundance changes and potential need for management response more frequently than through intermittent stock assessments. There are eight GOM/GBK stock recruit indicators updated for each assessment: spring and fall indices for each of the ME/NH, MA DMF, NEFSC GOM, and NEFSC GBK bottom trawl surveys. The NEFSC indicators in the GOM and GBK regions are considered to be indicators of offshore recruitment which differs from the GOM/GBK stock-wide recruitment dynamics. Therefore, the American Lobster Technical Committee (TC) recommended using only the inshore surveys (ME/NH and MA DMF) where the bulk of the population and fishery occur, which are assumed to be more representative of stock-wide recruitment. These trawl surveys employ similar methodologies and, along with selectivity and swept area calibration factors, can be combined into two indices, a spring index and a fall index. Additionally, the TC recommends using the standardized index from the Ventless Trap Survey as an indicator of recruitment during the summer.

To calculate a trigger index, each of the three individual indices were scaled to their 2017 reference levels so they are on the same scale. The one year lag expected between recruit indices and reference abundance due to growth results in 2017 recruit indices mapping to the terminal year reference abundance used in the 2020 stock assessment status determination (2018). The TC recommended linking the trigger index to the reference abundance in this way so the trigger index is an indication of proportional changes to the reference abundance since the 2020 stock assessment. Proportional changes in the trigger index are compared directly to proportional changes between the terminal year reference abundance and abundance reference points established in the assessment to provide an early indication of reference abundance falling below the reference points. Scaled indices were then averaged across surveys to generate a single trigger index. The final trigger index value represents proportional change from 2017 recruitment (and, therefore, expected proportional change from the reference abundance one year later in 2018 - the terminal year of the stock assessment). A value of one indicates no change, a value greater than one indicates an increase (e.g., 1.2 indicates a 20% increase), and a value less than one indicates a decrease (e.g., 0.8 indicates a 20% decrease).

During the 2020 stock assessment, the peer review panel supported using a smoothing algorithm, such as the running average used in past assessments, to determine stock status, but also recommended exploring alternatives (e.g., running median) to evaluate the robustness of status determinations. To evaluate performance of different methods for a trigger mechanism, akin to evaluating stock status in a stock assessment, a simulation analysis was conducted using the trigger index annual point value, three-year running average, and three-year running median to identify need for management action. For each method, all three individual indices were scaled to a 2017 reference level calculated with the same method used to calculate the

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index. That is, the 2017 reference level was the 2017 point value for the annual index trigger method, the 2015-2017 average for the three-year running average trigger method, and the 2015-2017 running median for the three-year running median trigger method. The scaled individual and combined indices are compared to various trigger points related to assessment abundance reference points in Figure 1.

The TC treated 0.68 (i.e., a 32% decline) as the trigger for action in the simulation analysis. This decline represents the proportional change between the terminal year stock assessment reference abundance level and the boundary between the high and moderate abundance regimes. Each individual index was projected from 2018 to 2025 following a steady decline that reflected a 32% decline from the observed 2017 index value in 2021. This projected trend is hypothetical to evaluate the performance of the three calculation methods being considered and does not necessarily reflect the true status or projection of the population. It was unclear what impacts the method used to calculate the starting point of the projected trend would have on performance of each trigger mechanism, so declines projected from the (1) 2017 point value, (2) 2015-2017 running average, and (3) 2015-2017 running median were evaluated in three separate scenarios. Indices were then sampled from these simulated trends with CVs equal to the average CV over the respective index's time series, assuming a lognormal error structure. These simulations only consider observation error and do not account for process error. Indices were scaled to their reference level as described above, averaged across surveys, and the combined trigger index was evaluated for whether or not it would trigger action (≤ 0.68) in each year of the projection period. This was repeated 1,000 times for each scenario and action determinations were tallied by year for each of the methods.

Results show similar patterns between the scenarios using a simulated decline from the 2017 point value and from the 2015-2017 average (Table 1; Figures 2-3). The 2015-2017 running median was equal to the 2017 point value for all indices, so the results with a simulated decline from this value were identical to the 2017 point value scenario (Table 2; Figure 4). Incorrect action is triggered very infrequently ($< 3\%$ of the time) by the annual and running median methods in the first two years of the projection period and never by the running average method. On average, the annual and running median methods incorrectly triggered action about 9% of the time and about 15 times more frequently than the running average method the year before the decline reached the threshold (2020), but also correctly triggered action $\approx 38\%$ of the time and roughly twice as frequently as the running average method in the year when the threshold was met (2021). The running average method then tended to perform as well as or better than the other methods from 2022-2025, albeit generally at smaller margins of difference, as all methods tended to perform relatively well in these later years when the decline is exacerbated. The delayed response of the running average method can be seen in Figures 5-7, where the median trigger index value across simulations tends to be slightly higher than the annual and running median methods. The variance in index values, however, is lower for the running average method resulting in more consistency across simulations in terms of guidance for management action, whereas the other methods result in mixed guidance for some of the more extreme simulations in more years than the running average method.

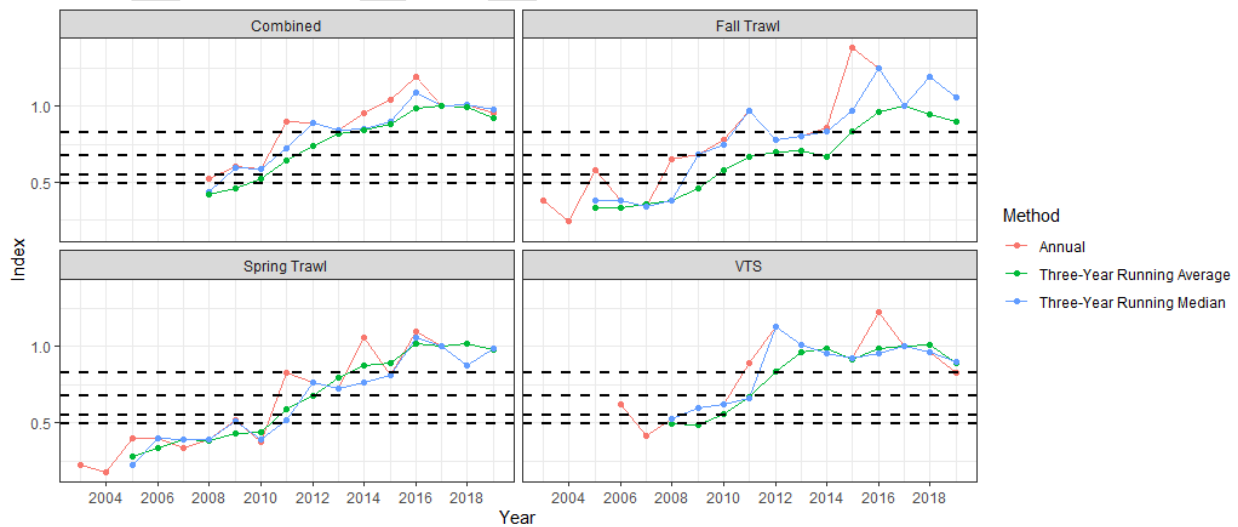
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Based on these results, the trigger mechanisms using the annual point value and the running median may be considered precautionary methods that perform better for an immediate trigger, on average, but with more variable guidance than the running average method. The running average method may provide a less responsive trigger mechanism that is less likely to incorrectly trigger premature action, and performs well and more consistently after the initial risk of not triggering action when first needed.

The TC recommended the running average method for calculating the trigger index. The individual surveys display interannual variation that might be related to environmental impacts on catchability (for example), an issue that was identified in the stock assessment and is expected to continue to impact these indices index data sets into the future. This simulation analysis suggests the running average method is more robust to interannual variation than the other methods and therefore can be interpreted with higher confidence.

Table 1. Percentage of 1,000 simulated indices that triggered action for three simulated decline starting point scenarios, and the averages of these scenarios. The simulated stock was projected to decline 32% in 2021.

Simulated Decline Starting Point	Index Calculation Method	2018	2019	2020	2021	2022	2023	2024	2025
2017 Point Value	Annual	0%	2%	12%	50%	85%	97%	100%	100%
	Three-Year Running Average	0%	0%	1%	27%	86%	100%	100%	100%
	Three-Year Running Median	0%	2%	12%	44%	84%	98%	100%	100%
2015-2017 Average	Annual	0%	0%	3%	21%	59%	89%	99%	100%
	Three-Year Running Average	0%	0%	0%	3%	46%	95%	100%	100%
	Three-Year Running Median	0%	0%	3%	19%	60%	90%	99%	100%
2015-2017 Running Median	Annual	0%	2%	12%	50%	85%	97%	100%	100%
	Three-Year Running Average	0%	0%	1%	27%	86%	100%	100%	100%
	Three-Year Running Median	0%	2%	12%	44%	84%	98%	100%	100%
Average	Annual	0%	2%	9%	40%	76%	94%	100%	100%
	Three-Year Running Average	0%	0%	1%	19%	73%	98%	100%	100%
	Three-Year Running Median	0%	1%	9%	36%	76%	95%	100%	100%



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Figure 1. Scaled individual and combined indices using three calculation methods compared to four trigger levels (0.83 – Fishery/Industry Target, 0.68 – Moderate/High Abundance Regime Shift Level, 0.55 – Abundance Limit, 0.49 – Abundance Threshold) identified from potential reference abundance declines (dashed lines).

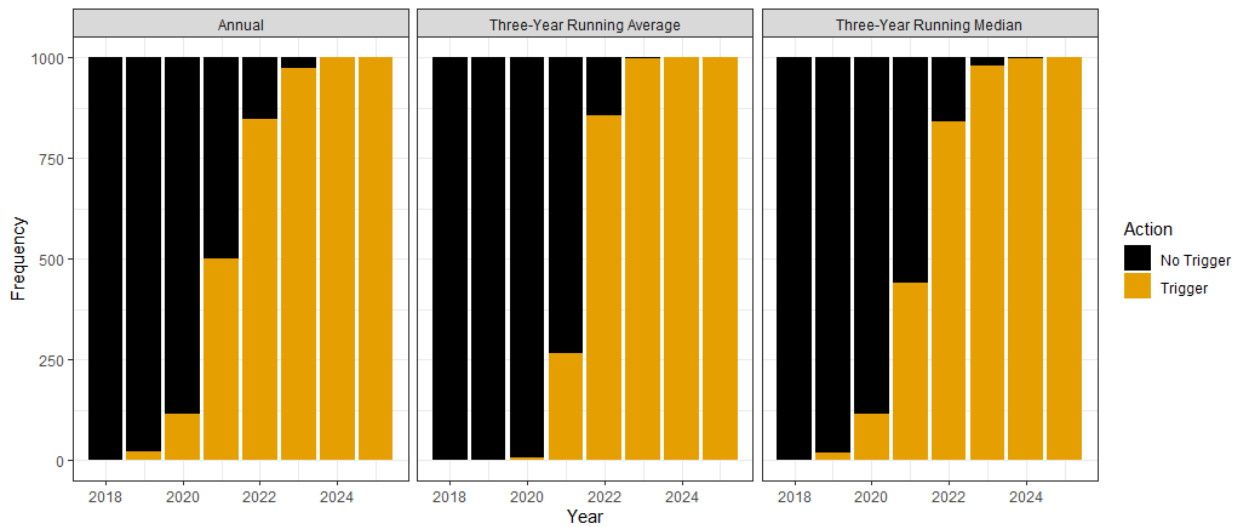


Figure 2. Annual action determinations by method from 1,000 simulated indices with the simulated population declining from the 2017 point value. The simulated stock was projected to decline 32% in 2021.

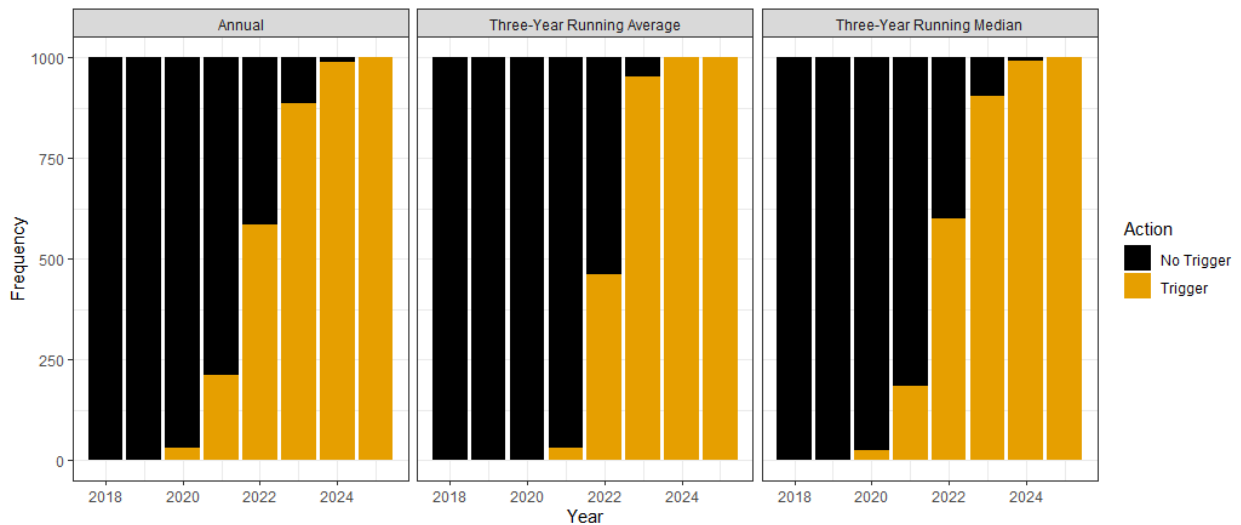


Figure 3. Annual action determinations by method from 1,000 simulated indices with the simulated population declining from the 2015-2017 average. The simulated stock was projected to decline 32% in 2021.

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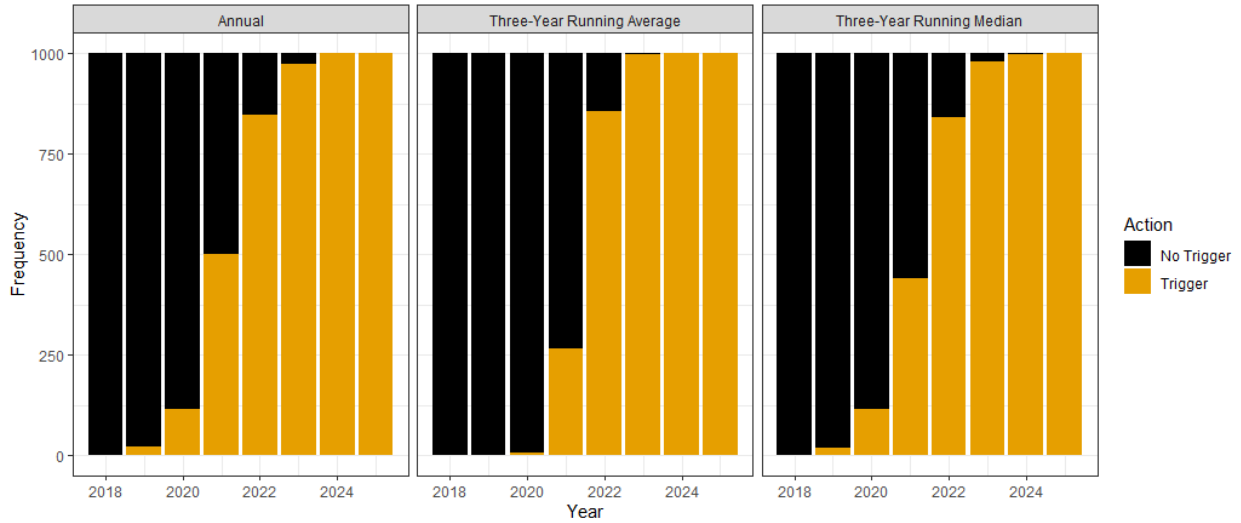


Figure 4. Annual action determinations by method from 1,000 simulated indices with the simulated population declining from the 2015-2017 median. The simulated stock was projected to decline 32% in 2021.

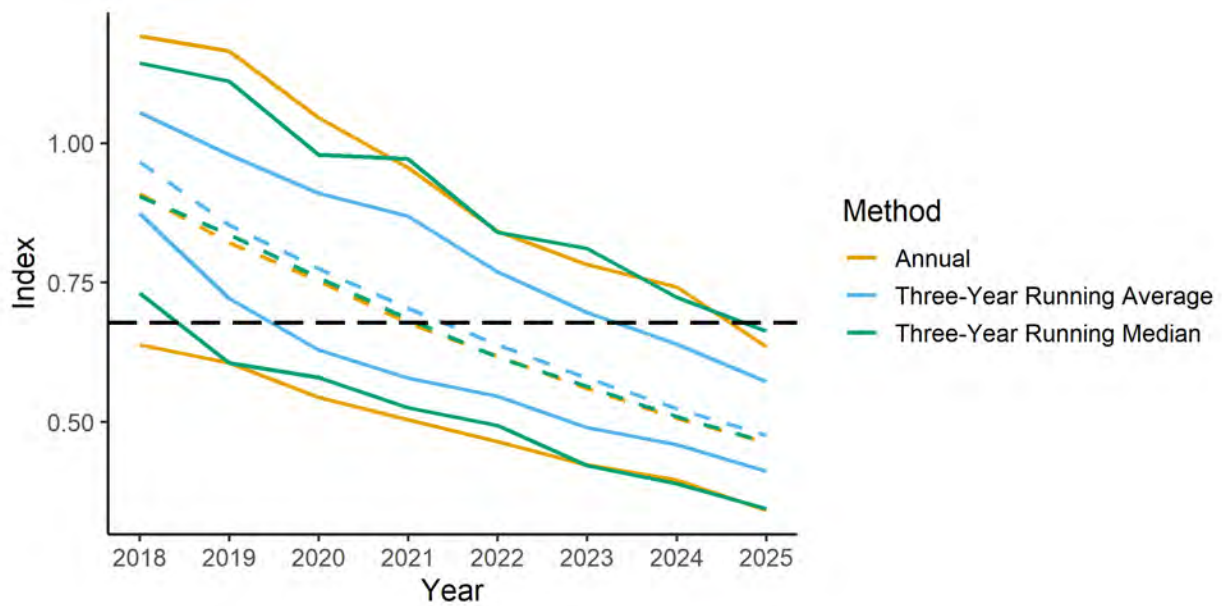


Figure 5. Distribution of index values by method from 1,000 simulations with the simulated population declining from the 2017 point value. The dashed colored lines are the median index values across simulations, the solid color lines are the minimum and maximum index values across simulations, and the dashed black line is the trigger level. The simulated stock was projected to decline 32% in 2021.

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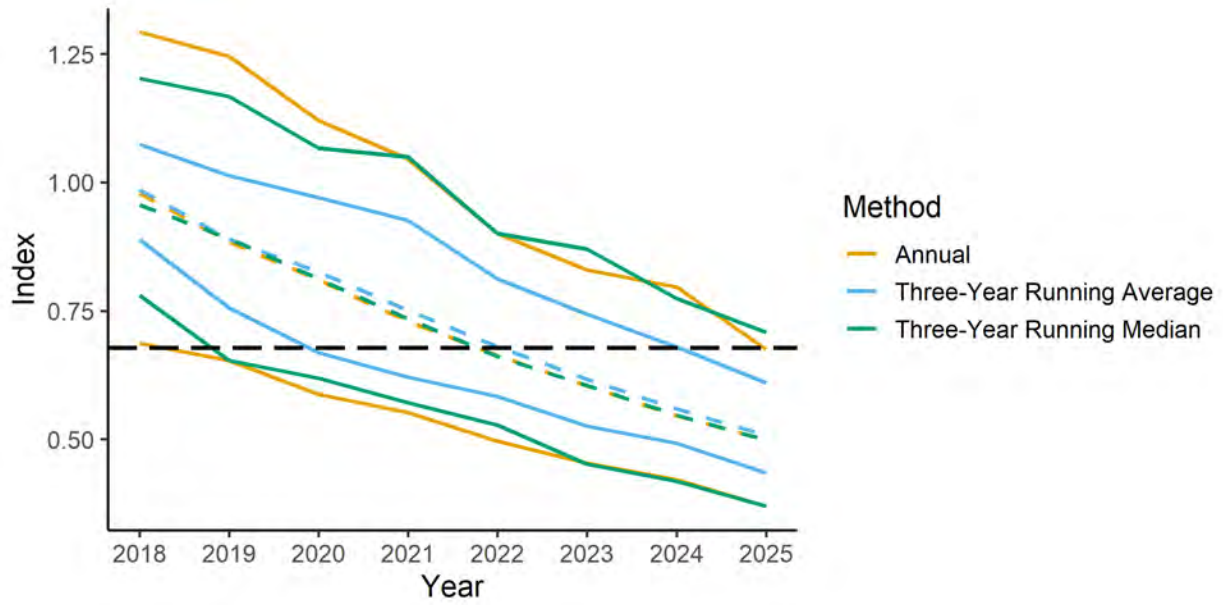


Figure 6. Distribution of index values by method from 1,000 simulations with the simulated population declining from the 2015-2017 running average. The dashed colored lines are the median index values across simulations, the solid color lines are the minimum and maximum index values across simulations, and the dashed black line is the trigger level. The simulated stock was projected to decline 32% in 2021.

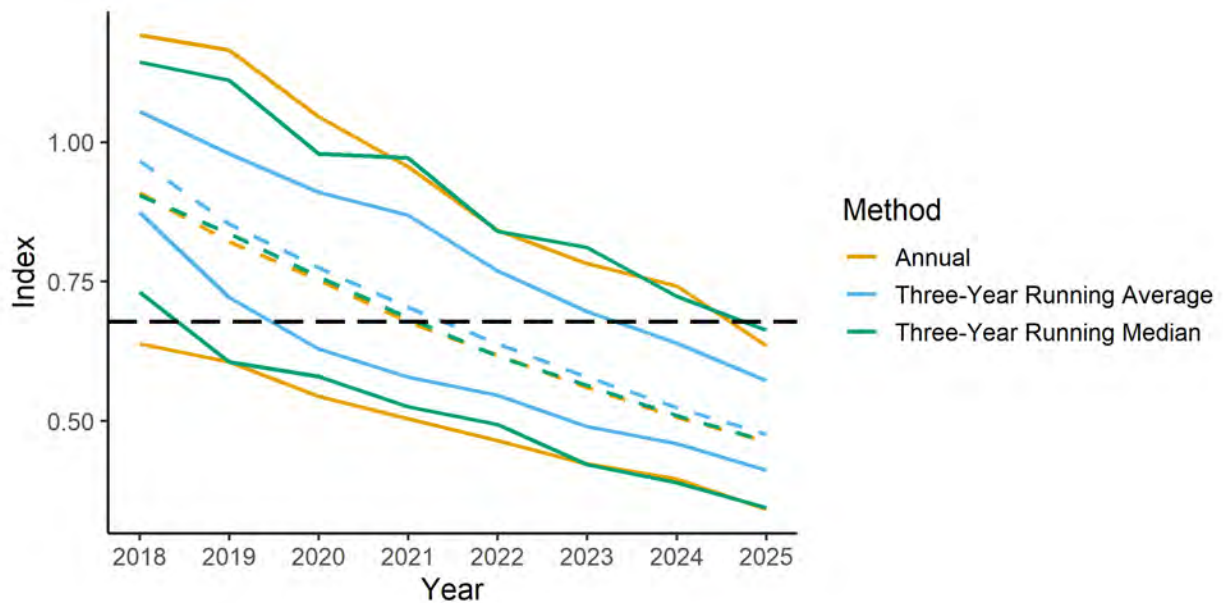


Figure 7. Distribution of index values by method from 1,000 simulations with the simulated population declining from the 2015-2017 running median. The dashed colored lines are the median index values across simulations, the solid color lines are the minimum and maximum index values across simulations, and the dashed black line is the trigger level. The simulated stock was projected to decline 32% in 2021.

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ATLANTIC STATES MARINE FISHERIES COMMISSION

REVIEW OF THE INTERSTATE FISHERY MANAGEMENT PLAN

**FOR AMERICAN LOBSTER
(*Homarus americanus*)**

2021 FISHING YEAR



Prepared by the Plan Review Team

October 2022



Sustainable and Cooperative Management of Atlantic Coastal Fisheries

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This document covers fishery activities in 2020 as well as a summary of trap transfers that took place ahead of the 2022 fishing year.

1.0 Status of the Fishery Management Plan

<u>Year of ASMFC Plan's Adoption:</u>	Amendment 3 (1997)
<u>Plan Addenda:</u>	
Addendum II (2001)	Addendum XV (2009)
Addendum III (2002)	Addendum XVI (2010)
Addendum IV (2003)	Addendum XVII (2012)
Addendum V (2004)	Addendum XVIII (2012)
Addendum VI (2005)	Addendum XIX (2013)
Addendum VII (2005)	Addendum XX (2013)
Addendum VIII (2006)	Addendum XXI (2013)
Addendum IX (2006)	Addendum XXII (2013)
Addendum X (2007)	Addendum XXIII (2014)
Addendum XI (2007)	Addendum XXIV (2015)
Addendum XII (2008)	Addendum XXVI (2018)
Addendum XIII (2008)	Addendum XXIX (2022)
Addendum XIV (2009)	
<u>Management Unit:</u>	Maine through North Carolina
<u>States with a Declared Interest:</u>	Maine through Virginia (Excluding Pennsylvania and DC)
<u>Active Committees:</u>	American Lobster Management Board, Technical Committee, Lobster Conservation Management Teams, Plan Development Team, Plan Review Team, Advisory Panel, Electronic Reporting Subcommittee, Electronic Tracking Subcommittee, Stock Assessment Subcommittee

2.0 Status of the Fishery

2.1 Commercial Fishery

The lobster fishery has seen incredible expansion in landings over the last 40 years. Between 1950 and 1975, landings were fairly stable around 30 million pounds; however, from 1976 to 2008 the average coastwide landings tripled, exceeding 98 million pounds in 2006. Landings continued to increase until reaching a high of 159 million pounds in 2016 (Table 1). In 2021, coastwide commercial landings were approximately 134 million pounds, a 10% increase from 2020 landings of 121.9 million pounds. The largest contributors to the 2021 fishery were Maine and Massachusetts with 82% and 13% of landings, respectively. The ex-vessel value for all lobster landings in 2021 was nearly \$875 million, the highest value on record for the American lobster fishery.

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Historically, Lobster Conservation Management Area (LCMA) 1 has had the highest landings, and accounted for 80% of total harvest between 1981 and 2012. This is followed by LCMA 3 which accounted for 9% of total landings during the same time period. In general, landings have increased in LCMA 1 and have decreased in LCMAs 2, 4, and 6. According to state compliance reports, in 2021, approximately 92% of the total landings came from LCMA 1, while the remaining 8% were contributed by the other LCMAs. A map of the LCMAs is found in Figure 1.

Landings trends between the two biological stocks have also changed, as a greater percentage of lobster are harvested from the Gulf of Maine/Georges Bank (GOM/GBK) stock. In 1997, 26.3% of coastwide landings came from the Southern New England (SNE) stock. However, as the southern stock declined and abundance in the Gulf of Maine increased, proportional harvest has significantly changed. In 2000, only 15.6% of landings came from the SNE stock and by 2006, this declined to 7%. In 2021, approximately 1.8% of coastwide landings came from the SNE stock. In 2021 the GOM/GBK stock accounted for 131.8 million pounds while the SNE stock accounted for 2.4 million.

2.2 Recreational Fishery

Lobster is also taken recreationally with pots, and in some states, by hand while SCUBA diving. While not all states collect recreational harvest data, some do report the number of pounds landed recreationally and/or the number of recreational permits issued. In 2021, New Hampshire reported 5,512 pounds of lobster harvested recreationally and New York reported 4,901 pounds. Maine, Rhode Island, and Connecticut do not collect information on the number of pounds recreationally harvested. For 2021, Rhode Island issued 535 lobster licenses, and lobster licenses sold in Connecticut declined to 222 in 2021. Massachusetts has not provided recreational landings data in recent years, but for the past five years that data were available (2011-2015) recreational lobster landings represented an average of 1.4% of the total state landings.

3.0 Status of the Stock

The recent 2020 American Lobster Benchmark Stock Assessment presents contrasting results for the two American lobster stock units, with record high abundance and recruitment in the Gulf of Maine and Georges Bank stock (GOM/GBK) and record low abundance and recruitment in the Southern New England stock (SNE) in recent years.

The assessment found that abundance estimates for the GOM/GBK stock show an increasing trend beginning in the late 1980s. After 2008, the rate of increase accelerated to a record high abundance level in 2018, the terminal year of the assessment. The GOM/GBK stock shifted from a low abundance regime during the early 1980s through 1995 to a moderate abundance regime during 1996-2008, and shifted once again to a high abundance regime during 2009-2018 (Figure 2). Current spawning stock abundance and recruitment are near record highs. Exploitation (commercial landings relative to stock abundance) declined in the late 1980s and has remained relatively stable since.

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The GOM/GBK stock is in favorable condition based on the new recommended reference points adopted by the Board (Table 2). The average abundance from 2016-2018 was 256 million lobster, which is greater than the fishery/industry target of 212 million lobster. The average exploitation from 2016-2018 was 0.459, below the exploitation target of 0.461. Therefore the GOM/GBK lobster stock is not depleted and overfishing is not occurring.

In contrast to GOM/GBK, model results for SNE show a completely different picture of stock health. Abundance estimates in SNE have declined since the late 1990s to record low levels. Model estimates of recruitment and spawning stock biomass have also declined to record low levels. Analysis of these estimates indicates a declining trend in stock productivity, indicating reproductive rates are insufficient to sustain a stable population at current exploitation rates. Exploitation of the SNE stock was high and stable through 2002, declined sharply in 2003, and has remained lower and stable since.

Based on the new abundance threshold reference point, the SNE stock is significantly depleted. The average abundance from 2016-2018 was 7 million lobster, well below the threshold of 20 million lobster (Table 2, Figure 3). However, according to the exploitation reference points the SNE stock is not experiencing overfishing. The average exploitation from 2016-2018 was 0.274, falling between the exploitation threshold of 0.290 and the exploitation target of 0.257.

The assessment and peer review panel recommended significant management action be taken to provide the best chance of stabilizing or improving abundance and reproductive capacity of the SNE stock.

4.0 Status of Management Measures

4.1 Implemented Regulations

Amendment 3 established regulations which require coastwide and area specific measures applicable to commercial fishing (Table 3). The coastwide requirements from Amendment 3 are summarized below; additional requirements were established through subsequent Addenda.

Coastwide Requirements and Prohibited Actions

- Prohibition on possession of berried or scrubbed lobsters
- Prohibition on possession of lobster meats, detached tails, claws, or other parts of lobsters by fishermen
- Prohibition on spearing lobsters
- Prohibition on possession of v-notched female lobsters
- Requirement for biodegradable “ghost” panel for traps
- Minimum gauge size of 3-1/4”
- Limits on landings by fishermen using gear or methods other than traps to 100 lobsters per day or 500 lobsters per trip for trips 5 days or longer
- Requirements for permits and licensing
- All lobster traps must contain at least one escape vent with a minimum size of 1-15/16” by 5-3/4”
- Maximum trap size of 22,950 cubic inches in all areas except area 3, where traps may not exceed a volume of 30,100 cubic inches.

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Amendment 3 to the Interstate Fishery Management Plan for American Lobster (December 1997)

American lobster is managed under Amendment 3 to the Interstate FMP for American Lobster. Amendment 3 establishes seven lobster management areas. These areas include the: Inshore Gulf of Maine (LCMA 1), Inshore Southern New England (LCMA 2), Offshore Waters (LCMA 3), Inshore Northern Mid-Atlantic (LCMA 4), Inshore Southern Mid-Atlantic (LCMA 5), New York and Connecticut State Waters (LCMA 6), and Outer Cape Cod (OCC). Lobster Conservation Management Teams (LCMTs) comprised of industry representatives were formed for each management area. The LCMTs are charged with advising the Lobster Board and recommending changes to the management plan within their areas.

Amendment 3 also provides the flexibility to respond to current conditions of the resource and fishery by making changes to the management program through addenda. The commercial fishery is primarily controlled through minimum/maximum size limits, trap limits, and v-notching of egg-bearing females.

Addendum I (August 1999)

Establishes trap limits in the seven LCMAs.

Addendum II (February 2001)

Establishes regulations for increasing egg production through a variety of LCMT proposed management measures including, but not limited to, increased minimum gauge sizes in LCMAs 2, 3, 4, 5, and the Outer Cape.

Addendum III (February 2002)

Revises management measures for all seven LCMAs in order to meet the revised egg-rebuilding schedule.

Technical Addendum 1 (August 2002)

Eradicates the vessel upgrade provision for LCMA 5.

Addendum IV (January 2004)

Changes vent size requirements; applies the most restrictive rule on an area trap cap basis without regard to the individual's allocation; establishes LCMA 3 sliding scale trap reduction plan and transferable trap program to increase active trap reductions by 10%; and establishes an effort control program and gauge increases for LCMA 2; and a desire to change the interpretation of the most restrictive rule.

Addendum V (March 2004)

Amends Addendum IV transferability program for LCMA 3. It establishes a trap cap of 2200 with a conservation tax of 50% when the purchaser owns 1800 to 2200 traps and 10% for all others.

Addendum VI (February 2005)

Replaces two effort control measures for LCMA 2 – permits an eligibility period.

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Addendum VII (November 2005)

Revises LCMA 2 effort control plan to include capping traps fished at recent levels and maintaining 3 3/8" minimum size limit.

Addendum VIII (May 2006)

Establishes new biological reference points to determine the stock status of the American lobster resource (fishing mortality and abundance targets and thresholds for the three stock assessment areas) and enhances data collection requirements.

Addendum IX (October 2006)

Establishes a 10% conservation tax under the LCMA 2 trap transfer program.

Addendum X (February 2007)

Establishes a coastwide reporting and data collection program that includes dealer and harvester reporting, at-sea sampling, port sampling, and fishery-independent data collection replacing the requirements in Addendum VIII.

Addendum XI (May 2007)

Establishes measures to rebuild the SNE stock, including a 15-year rebuilding timeline (ending in 2022) with a provision to end overfishing immediately. The Addendum also establishes measures to discourage delayed implementation of required management measures.

Addendum XII (February 2009)

Addresses issues which arise when fishing privileges are transferred, either when whole businesses are transferred, when dual state/federal permits are split, or when individual trap allocations are transferred as part of a trap transferability program. In order to ensure the various LCMA-specific effort control plans remain cohesive and viable, this addendum does three things. First, it clarifies certain foundational principles present in the Commission's overall history-based trap allocation effort control plan. Second, it redefines the most restrictive rule. Third, it establishes management measures to ensure history-based trap allocation effort control plans in the various LCMAs are implemented without undermining resource conservation efforts of neighboring jurisdictions or LCMAs.

Addendum XIII (May 2008)

Solidifies the transfer program for OCC and stops the current trap reductions.

Addendum XIV (May 2009)

Alters two aspects of the LCMA 3 trap transfer program. It lowers the maximum trap cap to 2000 for an individual that transfers traps. It changes the conservation tax on full business sales to 10% and for partial trap transfers to 20%.

Addendum XV (November 2009)

Establishes a limited entry program and criteria for Federal waters of LCMA 1.

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Addendum XVI: Reference Points (May 2010)

Establishes new biological reference points to determine the stock status of the American lobster resource (fishing mortality and abundance targets and thresholds for the three stock assessment areas). The addendum also modifies the procedures for adopting reference points to allow the Board to take action on advice following a peer reviewed assessment.

Addendum XVII (February 2012)

Institutes a 10% reduction in exploitation for LCMAs within Southern New England (2, 3, 4, 5, and 6). Regulations are LCMA specific but include v-notch programs, closed seasons, and size limit changes.

Addendum XVIII (August 2012)

Reduces traps allocations by 50% for LCMA 2 and 25% for LCMA 3.

Addendum XIX (February 2013)

Modifies the conservation tax for LCMA 3 to a single transfer tax of 10% for full or partial business sales.

Addendum XX (May 2013)

Prohibits lobstermen from setting or storing lobster traps in Closed Area II from November 1 to June 15 annually. Any gear set in this area during this time will be considered derelict gear. This addendum represents an agreement between the lobster industry and the groundfish sector.

Addendum XXI (August 2013)

Addresses changes in the transferability program for LCMAs 2 and 3. Specific measures include the transfer of multi-LCMA trap allocations and trap caps.

Addendum XXII (November 2013)

Implements Single Ownership and Aggregate Ownership caps in LCMA 3. Specifically, it allows LCMA 3 permit holders to purchase lobster traps above the cap of 2000 traps; however, these traps cannot be fished until approved by the permit holder's regulating agency or once trap reductions commence. The Aggregate Ownership Cap limits LCMA fishermen or companies from owning more traps than five times the Single Ownership Cap.

Addendum XXIII (August 2014)

Updates Amendment 3's habitat section to include information on the habitat requirements and tolerances of American lobster by life stage.

Addendum XXIV (May 2015)

Aligns state and federal measure for trap transfer in LCMA's 2, 3, and the Outer Cape Cod regarding the conservation tax when whole businesses are transferred, trap transfer increments, and restrictions on trap transfers among dual permit holders.

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Addendum XXVI (February 2018)

Advances the collection of harvester and biological data in the lobster fishery by improving the spatial resolution of data collection, requiring harvesters to report additional data elements, and establishing a deadline that within five years, states are required to implement 100% harvester reporting. The Addendum also improves the biological sampling requirements by establishing a baseline of ten sampling trips per year, and encourages states with more than 10% of coastwide landings to conduct additional sampling trips. Required reporting of additional data elements went into effect on January 1, 2019. The Addendum XXVI requirement for commercial harvesters to report their fishing location by 10 minute longitudinal/latitudinal square was implemented in 2021.

Addendum XXIX (2022)

Implements electronic tracking requirements for federally-permitted vessels in the American lobster and Jonah crab fisheries to collect high resolution spatial and temporal effort data. Specifically, electronic tracking devices will be required for vessels with commercial trap gear area permits for LCMAs 1, 2, 3, 4, 5, and Outer Cape Cod. Requirements will become effective in 2023.

4.2 On-Going Management Actions

In response to signs of reduced settlement in the GOM/GBK, the Board initiated Draft Addendum XXVII in August 2017 to increase resiliency through considering the standardization of management measures in the GOM/GBK stock. Due to the prioritization of actions in response to the Atlantic Large Whale Take Reduction Team recommendations, development of this addendum stalled. Following its review of the 2020 Benchmark Stock Assessment and Peer Review Report, the Board reinitiated development of Draft Addendum XXVII. The Board revised the objective of the addendum given persistent low settlement indices and recent decreases in recruit indices in recent years. The Board specified that the addendum should consider a trigger mechanism such that, upon reaching the trigger, measures would be automatically implemented to increase the overall protection of spawning stock biomass of the GOM/GBK stock.

5.0 Trap Reductions

Addendum XVIII established a series of trap reductions in LCMAs 2 and 3, with the intent of scaling the size of the SNE fishery to the size of the resource. Specifically, a 25% reduction in year 1 followed by a series of 5% reductions for five years was established in LCMA 2; a series of 5% reductions over five years was established in LCMA 3. The fifth year of reductions took place at the end of the 2019 fishing year and affect trap allocations in the 2020 fishery. The sixth year of reductions for LCMA 2 took place at the end of the 2020 fishing year and affects trap allocations in the 2021 fishery. Trap reductions for LCMA 2 and 3 are now complete. Per Addendum XVIII, states with fishermen in LCMAs 2 and 3 are required to report on the degree of consolidation that has taken place. It is important to note that trap reductions also occur as the result of trap transfers as, per Addendum XIX, there is a 10% conservation tax on trap allocation transfers between owners. The series of federal trap reductions is summarized in Tables 4 and 5.

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6.0 Fishery Dependent Monitoring

The following provisions of Addendum XXVI went into effect January 1, 2019:

- Required reporting of additional data elements;
- Requirement to implement 100% harvester reporting within five years;
- Baseline biological sampling requirement of ten sea and/or port sampling trips per year.

The Addendum XXVI requirement for commercial harvesters to report their fishing location by 10 minute longitudinal/latitudinal square will not be implemented until 2021. Table 5 describes the level of reporting and monitoring programs by each state. *De minimis* states are not required to conduct biological sampling of their lobster fishery.

In 2021, all states except Connecticut and New Jersey completed the 10 required sea and/or port sampling trips for fishery dependent monitoring. Due to the COVID-19 pandemic, at sea observer trips were suspended in New Jersey for 2021. New Jersey continues to monitor the situation and has started to develop protocol for a safe return to normal field operations. No fishery dependent sampling has been conducted by Connecticut since 2014 due to reductions in funding and staffing levels.

7.0 Status of Fishery Independent Monitoring

Addendum XXVI also requires fishery independent data collection by requiring statistical areas be sampled through one of the following methods: annual trawl survey, ventless trap survey, or young-of-year survey.

7.1 Trawl Surveys

Maine and New Hampshire: The Maine-New Hampshire Inshore Trawl survey began in 2000 and covers approximately two-thirds of the inshore portion of Gulf of Maine. The spring survey began May 5, 2021 in Portsmouth, NH and ended on June 6, 2021 off of Lubec, Maine. 118 out of 120 scheduled tows were completed, resulting in a 98% completion rate. A total of 15,347 lobsters were caught and sampled, with 7,524 females, 7,821 males and 2 unsexed caught and measured (Figure 4). The fall survey began September 27, 2021 in Portsmouth, NH and ended on October 29, 2021 off of Lubec, Maine. 89 out of 120 scheduled tows were completed, resulting in a 74% completion rate. A total of 11,589 lobsters were caught and sampled, with 5,663 females, 5,893 males and 28 unsexed caught and measured (some lobsters were missed due to faulty recording of data) (Figure 5).

Massachusetts: Since 1978, the Division of Marine Fisheries has conducted spring and autumn bottom trawl surveys in the territorial waters of Massachusetts. For the first time since 1978, neither the spring nor fall bottom trawl surveys were conducted in 2020 due to the COVID-19 pandemic, but the survey resumed in 2021. After low levels observed in the GOM during the early to mid 2000s, relative abundance indices have increased over the last decade. While legal abundance has remained high relative to the time series median for 2019 and 2021, sublegal-sized abundance was close to the median in those two years. In SNE, relative abundance from the spring and fall surveys remains low (Figure 6).

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Rhode Island: The Rhode Island DFW Trawl Survey program conducted seasonal surveys in the spring and fall, as well as a monthly survey. In 2021, 44 trawls were conducted in the Spring and 43 in the Fall. The Monthly Survey includes monthly trawls throughout Narragansett Bay. In 2021 156 trawls were performed as part of the Monthly program. Spring 2021 mean CPUEs were 0.05 and 0.61 for legal and sublegal lobsters (respectively), where Fall 2021 CPUE was 0.02 for legal lobsters and 0.21 for sublegal lobsters. The 2021 mean Monthly trawl CPUEs were 0.04 and 0.54 per-tow for legal and sublegal lobsters, respectively (Figure 7).

Connecticut and New York: Juvenile and adult abundance are monitored through the Long Island Sound Trawl Survey during the spring (April, May, June) and the fall (September, October) cruises all within NMFS statistical area 611. Due to the COVID-19 pandemic, the spring and fall 2020 Long Island Sound Trawl Surveys were not conducted; an estimated index is shown as the average of 2019 and 2021. The spring 2021 lobster abundance index (geometric mean = 0.04 lobsters/tow) was the third lowest in the time series. Spring abundance in the last nine years (2011-2021) remains less than 1.0. All indices from 2004-2021 are below the time series median (3.10). The fall 2021 lobster abundance index (geometric mean = 0.02 lobsters/tow) was a slight improvement from 2019 when no lobsters were caught in September and October. The fall time series median (3.33) has not been exceeded since 2004. Both legal and sublegal size lobster abundance has declined with a similar trajectory (Figure 8).

New York: New York initiated a stratified random trawl survey in the near shore ocean waters off the south shore of Long Island in 2018 from the Rockaways to Montauk Point and the New York waters of Block Island Sound. Three sampling cruises were conducted in 2021 during the winter (February), spring (June), and summer (August). The summer cruise was cut short due to boat issues. These same boat issues were the reason the fall survey was not completed. Twenty, twenty-seven, and twelve stations were sampled respectively. Four lobsters were caught during the 2021 surveys.

New Jersey: An independent Ocean Trawl Survey is conducted from Sandy Hook, NJ to Cape May, NJ each year. The survey stratifies sampling in three depth gradients, inshore (18'-30'), mid-shore (30'-60'), offshore (60'-90'). The mean CPUE is calculated as the sum of the mean number of lobsters per size class collected in each sampling area weighted by the stratum area. Due to the COVID-19 pandemic, the survey did not take place for 2020 and 2021 and CPUE and indices were not obtained (Figure 9).

Maryland: Maryland conducted a 16-foot otter trawl survey in the coastal bays and has not encountered an American lobster in this survey (1989 - 2021).

7.2 Young of Year Index

Several states conduct young-of-year (YOY) surveys to detect trends in abundance of newly-settled and juvenile lobster populations. These surveys attempt to provide an accurate picture of the spatial pattern of lobster settlement. States hope to track juvenile populations and generate predictive models of future landings.

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Maine: There are currently 40 fixed stations along the Maine coast. Of these 40 stations 38 have been sampled consistently since 2001 with two additional sites added to Zone D, off midcoast Maine, in 2005. In recent years, these sites are sampled October to December. A new R script was developed in 2022 to pull the data directly from Maine's MARVIN archive database to create a replicable and transparent data query, but these numbers differ slightly from past data pulled. Cut-off values for YOY vary by year. This data query process is still being vetted (Figure 10).

New Hampshire: New Hampshire Fish and Game conducted a portion of the coastwide American Lobster Settlement Index (ALSI). In 2021, a total of 32 juvenile lobsters were sampled from three sites; 21 older juveniles, seven YOY lobster, and four one-year-old (Y+). Figure 11 depicts the CPUE (#/m²) of all sampled lobsters, YOY and Y+, for all New Hampshire sites combined from 2008 through 2021. For each of these indices, CPUE shows a general upward trend to a time series high in 2011 with sustained moderate to low levels from 2012 through 2021.

Massachusetts: Annual sampling for early benthic phase/juvenile (EBP) lobsters was conducted during August and September, 2021. Prior to 2019, sampling was completed at 21 sites spanning 7 regions in Massachusetts coastal waters. In 2019 changes to the survey were made discontinuing four locations in SNE (two in Buzzards Bay and both Vineyard Sound sites) and five sites in GOM (two South Shore locations and all three Cape Cod Bay locations). As of 2021, suction sampling is conducted in the GOM stock unit at 10 sites from Cape Ann to the south shore area, and in the SNE stock unit at 4 sites in Buzzards Bay. Data for those sites included in the 2020 stock assessment are presented. In 2021 densities of YOY lobsters remained low compared to the time series average in Boston Harbor and Salem Sound, but densities in 2021 were higher in Salem Sound than any years since 2011 (Figure 12). In SNE there were again no YOY lobsters found in the Buzzards Bay sampling locations.

Rhode Island: In 2021, the RI DEM DMF YOY Settlement Survey (Suction Sampling) was conducted at six fixed stations with twelve randomly selected 0.5 m² quadrats sampled at each survey station. The survey stations are located outside of Narragansett Bay along the southern Rhode Island coast, from Sachuest Point (east) to Point Judith (west). The index represents the average annual densities for YOY ($\leq 13\text{mm}$) and total lobsters caught (Figure 13). The 2021 YOY Settlement Survey index was 0.08 lobsters/m², and with all lobsters was 0.14/m².

Connecticut: The CT DEEP Larval Lobster Survey in western Long Island Sound was discontinued after 2012. Alternative monitoring data are available for the eastern Sound from the Millstone Power Station entrainment estimates of all stages of lobster larvae. Abundance indices in both programs are delta mean density of larvae per 1000 cubic meters of water, entrained into the power plant in the case of the Millstone program and stage 4 only captured in surface plankton samples in the CT DEEP program. Both programs show a protracted decline in recruitment following the 1999 die-off (correlation between programs: $R=0.35$, $p=0.066$) (Figure 14).

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7.3 Ventless Trap Survey

To address a need for a reliable index of lobster recruitment, a cooperative random stratified ventless trap survey was designed to generate accurate estimates of the spatial distribution of lobster length frequency and relative abundance while attempting to limit the biases identified in conventional fishery dependent surveys.

Maine: The Maine Ventless Trap Survey changed strategies in 2015 to cover more area by eliminating the vented traps at each site. This change allowed the survey to double the number of sites with ventless traps and increase the sampling coverage spatially to 276 sites. Traps were set during the months of June, July, and August. The stratified mean was calculated for each area using depth and statistical area for ventless traps only. Compared to the previous years, in 2021 there were decreases in the number of sublegal (<83 mm CL) lobsters in all areas and legal sized (≥ 83 mm CL) lobsters caught in the NH-Friendship (513) areas. There were increases in the number of legal sized (≥ 83 mm CL) lobsters caught in the Schoodic Point to Friendship (512) and the Schoodic Pt-Cutler (511) areas (Figure 15).

New Hampshire: Since 2009, NHF&G has been conducting the coastwide Random Stratified Ventless Trap Survey in state waters (statistical area 513). A total of six sites were surveyed twice a month from June through September in 2021. Catch per unit effort (stratified mean catch per trap haul) from 2009 through 2021 is presented in Figure 16. Annual stratified mean catch per trap haul values varied without significant positive or negative trend throughout the time series.

Massachusetts: The coast-wide ventless trap survey was initiated in 2006 and expanded in 2007 with the intention of establishing a standardized fishery-independent survey designed specifically to monitor lobster relative abundance and distribution. The survey was not conducted in 2013 due to a lack of funding; however, starting in 2014 the survey has been funded with lobster license revenues and will continue as a long-term survey.

Due to lack of interested participants in the SNE survey area (Area 538) in 2021, the SNE survey footprint was reduced, the number of hauls was reduced to one per month, and the time frame was reduced by one month to just June through August. These changes to the SNE survey necessitated re-analysis of the abundance time series to adjust to the reduced survey design. The data presented in Figure 17 and Figure 18 are the results of the new analysis. The entire SNE time series now represents June – August only, first haul of the month, and only those stations that occurred in the newly reduced footprint.

The time series of relative abundance for sublegal (< 83 mm CL) and legal-sized (≥ 83 mm CL) lobsters for Area 514 (part of LMA 1) is shown in Figure 17 as the stratified mean CPUE (\pm S.E.). Note that the index includes data from vented and non-vented traps, and includes all four survey months (June – Sept). The average catch of sublegal lobsters is much higher than the catch of legal-sized lobsters, and generally increased from 2006 through 2016 but has been declining since, with values from the last three years (2019-2021) falling below the time series

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average of 4.60 lobsters/trap. The stratified mean catch per trap of legal-sized lobsters in 2021 was 0.54 (± 0.01), and was below the time series average of 0.57.

The time series of relative abundance (stratified mean CPUE \pm S.E.) for sublegal (<86 mm CL) and legal-sized (≥ 86 mm CL) lobsters in the Area 538 (MA SNE survey area) is shown in Figure 18. The mean sublegal CPUE in 2021 was 1.43 (± 0.19), below the time series average of 1.95 lobsters/trap haul. The CPUE of legal-sized lobsters in 2021 was 0.34 (± 0.05), similar to the time series average of 0.34 lobsters/trap haul. The re-analysis of the time series to account for the reduced time period and survey area resulted in a similar trend over time for both sublegal and legal-sized lobster abundance, but a slight increase in the scale.

Rhode Island: In 2021, the Ventless Trap Survey was conducted during the months of June-August over 24 sampling sites. Over the 18 trips and 846 pots (ventless and vented) hauled, 2,695 lobsters were sampled. The depth-stratified abundance index of sublegal lobsters in the 2021 survey, 4.10 lobsters per ventless trap, remains below the time series mean of 5.96 lobsters per ventless trap (Figure 19). The abundance index for legal-sized lobsters, at 0.52, was above the time series mean of 0.37 lobsters per ventless trap (Figure 20). Region-specific indices vary- catch of sublegal lobsters in Block Island Sound and Narragansett Bay have generally fallen below the time series mean, while catches in Rhode Island Sound generally fell above the time series mean for the region.

Delaware: A pilot study was initiated in 2018 to assess the population structure of structure-oriented fish in the lower Delaware Bay and nearshore Atlantic Ocean. Sampling was conducted in the lower Delaware Bay and the nearshore Atlantic Ocean using commercial-sized ventless fish pots during April through December 2021. Four American lobsters were caught in lower Delaware Bay and 594 American lobsters in the nearshore Atlantic Ocean with a ratio of 58% males, 36% female and 6% egg laden. The sampled Atlantic Ocean lobsters ranged in length from 52 mm to 138 mm.

8.0 State Compliance

States are currently in compliance with all required biological management measures under Amendment 3 and Addendum I-XXIV; however, the Plan Review Team (PRT) notes that Connecticut and New Jersey did not conduct sea/port sampling in 2021, as required by Addendum XXVI. Due to the COVID-19 pandemic, some states had to cancel or limit the amount of surveys conducted. The states' reasons for not meeting the requirement are provided in Section 6.0.

9.0 De Minimis Requests

The states of Virginia, Maryland, and Delaware have requested *de minimis* status. According to Addendum I, states may qualify for *de minimis* status if their commercial landings in the two most recent years for which data are available do not exceed an average of 40,000 pounds. Delaware, Maryland, and Virginia meet the *de minimis* requirement.

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10.0 Regulatory Changes

New Hampshire

- Changes were made to weak link and gear marking for NH state waters.

Massachusetts

- 3/5/21 – DMF established a number of new regulations affecting commercial fixed gear fisheries, including the American lobster trap fishery, to further protect right whales from entanglement risks. These changes included:
 1. Extending the February 1 – April 30 commercial trap gear closure in both space and time to include all state waters north and east of Cape Cod and to have it remain in effect until May 15 unless otherwise rescinded or extended by DMF based on the presence and absence of right whales.
 2. Establishing a November 1 – May 15 closed season for recreational lobster and crab trap gear. Previously, there was no closed season for this fishery.
 3. Adopting a 1,700-pound buoy line breaking strength requirement for all commercial trap gear. This can be achieved by fishing “weak rope” that has a tensile strength of 1,700 pounds or less or rigging conventional buoy lines with approved weak contrivances once every 60’. Approved weak contrivances include certain 2’ segments of weak rope spliced into the buoy line or so-called “south shore sleeves” connecting a parted piece of buoy line.
 4. Implementing a maximum buoy line diameter for all trap gear. For recreational lobster and crab trap gear the maximum buoy line diameter is 5/16” and for commercial trap gear the maximum buoy line diameter is 3/8”.
 5. Capping the maximum number of commercial Student Lobster Permits DMF may issue in a single calendar year at 150.
- 7/09/21 – DMF adopted new buoy line marking requirements for all commercial trap gear, including lobster and edible crab traps. These buoy line marking requirements are consistent with those required by the Atlantic Large Whale Take Reduction Plan.

11.0 Enforcement Concerns

Maine

- In 2021 Maine Marine Patrol Officers documented 383 lobster-related violations, with 62 being summonses. Our highest profile cases for the year were 5 individuals being charged with molesting lobster gear and one individual found in possession of 19 undersized lobsters. Officers documented a considerable effort inspecting lobster gear throughout the year; between gear being hauled from our fleet of large patrol vessels, and documented vessel boardings at-sea, Marine Patrol inspected an estimated 25,000 lobster traps in 2021. The majority of the violations detected were for possessing illegal lobsters, protected resource violations and fishing untagged lobster gear.

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Massachusetts

- The Rushnak (2020) scrubbed lobster incident was settled administratively with a 3-month suspension and a 3-year probationary period. The criminal case was settled with a plea deal.
- The Birarelli (2020) incident was not handled administratively and the criminal matter is ongoing. This case dealt with v-notch, mutilated v's and shorts.
- The Roche (2021) incident went to administrative hearing and the coastal lobster permit was revoked. The criminal matter is ongoing. This case dealt with trap tag violations, trawl length violations, and whale safe buoy line violations.
- The Hamilton (2021) incident was settled administratively with a two-year suspension of Offshore Lobster Permit. There was a companion criminal summons, which is ongoing. This case dealt with possession of lobsters in excess of the gillnet bycatch allowance rules and reporting violations to conceal these overages.

12.0 Research Recommendations

The full list of research recommendations can be found in the 2020 Stock Assessment Report. Below is a summarized list of the high priority research recommendations from the 2020 Stock Assessment that were compiled by the Lobster Technical Committee (TC) and Stock Assessment Subcommittee (SAS).

Port and Sea Sampling - The quality of landings data has not been consistent spatially or temporally. Limited funding, and in some cases, elimination of sea sampling and port sampling programs will negatively affect the ability to characterize catch and conservation discards, limiting the ability of the model to accurately describe landings and stock conditions. It is imperative that funding for critical monitoring programs continues, particularly for offshore areas from which a large portion of current landings originate in SNE. Sea sampling should be increased in Long Island Sound (statistical area 611), and in the statistical areas in federal waters, particularly those fished by the LCMA 3 fleet, via a NMFS-implemented lobster-targeted sea sampling program.

Commercial Data Reporting – Finer resolution spatial data are paramount in understanding how landings align between statistical area and LCMAs. Vessel tracking is recommended for federal vessels. Once in place, the new spatial data should be analyzed for comparison to current spatial understanding of harvest. The growing Jonah crab fishery in SNE continues to complicate the differentiation of directed lobster versus Jonah crab effort. More sea sampling and landings data must be collected to better differentiate the two fisheries' activities.

Ventless Trap Survey - Calibration work to determine how catch in the ventless trap surveys relates to catch in the bottom trawl surveys remains an important and unaddressed topic of research. Ventless traps may be limited in their ability to differentiate between moderately high and extremely high abundance, and calibration with bottom trawl surveys may help to clarify how q might change with changes in lobster density.

NEAMAP Trawl Survey Protocols - The SAS recommends that the NEAMAP Trawl Survey sampling protocol be modified for all lobsters caught to be sorted by sex. If a subsample is

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necessary, subsamples be taken by sex for additional biological data (size, egg presence and stage, vnotch, etc.) This modification would align the biological sampling methodology with other trawl surveys used in the assessment, and perhaps allow the survey to not be collapsed by sex into survey slots.

Time Varying Growth - Growth of American lobster has been found to change through time (McMahan et al. 2016), yet the ability to incorporate this dynamic in the assessment model currently is unavailable. Accounting for interannual changes in the growth matrix, including those in increment, probability, and seasonality, is imperative for model convergence. Modification to the assessment model is needed to allow for time varying growth matrices to be used to reflect changing growth in the stocks.

Expansion of Growth Matrices - Exploration of expanding the model size structure to smaller sizes could allow the SAS to better capture changes in recruitment for the population by incorporating < 53mm lobster abundances from the surveys currently used, as well as incorporating additional surveys that currently are not model inputs for the assessment, such as those from the young of year settlement surveys. Due to decreased recruitment in SNE and some areas in GOMGBK, available survey data should be evaluated to determine whether current data sources for small sizes are sufficient for expanding the size structure and growth matrices.

Temperature-Molt Dynamics - Understanding how the timing for molting, molt increments, and probability by size vary with temperature for all stocks would allow for more accurate and realistic depictions of growth via updated annual growth matrices. The work of Groner et al. (2018) should be expanded by using the Millstone data to specifically analyze how molt frequency and increment has changed seasonally and interannually.

Larval Ecology - Spatial expansion of larval surveys and further testing is warranted, particularly in areas like the eastern GOM and GBK that lack any studies of this nature. Studies that explore greater spatial coverage of larval sampling and examine lobster larval diets, in situ development time in current conditions, larval interactions with well-mixed versus stratified water columns, and varying growth and mortality with temperature would allow for greater context on these variables' influence on recruitment.

Deepwater Settlement - There is a need to determine settlement success in habitat not currently sampled and its contribution to overall stock productivity. Research needs to explore the levels of detectability, impact of stratification, and interannual temperature effects on the indices. Additionally, it will be important to understand whether there are differences in growth and survival in these deeper habitats, particularly relative to the desire to expand the growth matrix into smaller size ranges for modeling purposes.

SNE Recruitment Failure - The direct cause of the precipitous declines in recruitment under less variable spawning stock biomass is largely unknown. Research designed to understand the causes driving recruitment failure is vital for any efforts toward rebuilding the SNE stock. In

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addition, being able to predict similar conditions in GOMGBK could allow management the opportunity to respond differently.

Stock Structure Working Group - The SAS recommends that a workshop on stock boundaries be convened prior to the initiation of the next assessment to review results of any new research and re-evaluate appropriate stock boundaries. Inclusion of Canadian researchers at this workshop would be beneficial to share data and knowledge on this shared resource.

Spatial Analyses of Fisheries-Independent Data – Northeast Fisheries Science Center (NEFSC) trawl survey data remains one of the richest data sources to understand abundance and distribution patterns through time for lobsters by size and sex. Formal analyses of NEFSC trawl survey and the ME/NH trawl survey and should be performed. The Ecosystem Monitoring (EcoMon) Program’s larval lobster information should also be considered.

Reevaluate Baseline Natural Mortality Rate - Intensive hypothesis-driven sensitivity analyses should be conducted to evaluate the base mortality rate for both stocks by season and year. Canadian tagging data should be examined to determine how natural mortality rates derived from these data compare to the assumptions used currently in the model and sensitivity analyses. Exploration of additional time series representing natural mortality hypotheses (e.g. sea temperature, shell disease prevalence, predators) should be continued to either inform time-varying natural mortality or correlate to rates produced in sensitivity analyses.

Predation Studies - It is suspected that a given predator’s role in lobster natural mortality has changed through time. Predation laboratory studies and gut content analyses would provide greater guidance on individual species’ roles in lobster natural mortality. With this information, predation-indices as a function of predator annual abundances and their contribution to stock-specific lobster mortality would be immensely valuable, particularly in SNE.

Management Strategy Evaluation - Developing a true management strategy evaluation tool that can iteratively project and refit the operating model would best inform future management discussions on rebuilding the SNE stock or providing resiliency for the GOM stock and fishery.

Economic Reference Points - Economic analyses considering landings, ex-vessel value, costs, associated economic multipliers, number of active participants, and other factors are imperative to truly discern how declines in the population would impact the GOMGBK industry. The SAS strongly recommends a thorough economics analysis be conducted by a panel of experts to more properly inform economic-based reference points, and ultimately provide resiliency to both the GOMGBK stock and fishery.

13.0 Plan Review Team Recommendations

During their review of the state compliance reports, the PRT noted the following issues:

- Massachusetts was unable to provide compliance reports by the August 1 deadline. This

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has been a recurring issue over the last few years due to delays in data availability and limited staff resources.

- In 2021, New Jersey and Connecticut did not meet the Addendum XXVI minimum requirement of ten sea/port sampling trips; no trips were completed by either state. The compliance report for New Jersey explains that sampling was impeded by the COVID-19 pandemic. For Connecticut, no reason was provided. Fishery dependent sampling has not been conducted by since 2014 because reductions in funding and staffing levels have hindered our ability to resume these activities.

The PRT Recommends the Board approve the *de minimis* requests of DE, MD, and VA. Other than the issues noted above, all states appear to be in compliance with the requirements of the FMP.

The following are general recommendations the PRT would like to raise to the Board:

- The PRT recommends the Board consider reviewing the monitoring requirements in SNE given the status of the stock and the difficulty obtaining sea sampling trips in a fishery with reduced effort. The TC has discussed the need for additional sampling trips in federal waters as the fishery has shifted offshore.
- The PRT recommends the TC discuss the best way to present state index information in the annual compliance reports to provide more detailed resolution of adult and juvenile abundance and size composition of the stock.
- The PRT recommends the Board engage with the Committee on Economic and Social Sciences (CESS) to consider available socioeconomic data to develop metrics that could be used to characterize changes in the fishery.

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14.0 Tables

Table 1. Landings (in pounds) of American Lobster by the states of Maine through Virginia.
Source: ACCSP Data Warehouse for 1981-2019 landings; state compliance reports for 2020 landings. C= confidential data.

	ME	NH	MA	RI	CT	NY	NJ	DE	MD	VA	Total
1981	22,631,614	793,400	11,420,638	1,871,067	807,911	890,218	593,801	55,700	63,108	2,173	39,129,630
1982	22,730,253	807,400	11,265,840	3,173,650	880,636	1,121,644	846,215	90,700	64,788	4,713	40,985,839
1983	21,976,555	1,310,560	12,867,378	5,114,486	1,654,163	1,207,442	769,913	56,700	76,192	20,619	45,054,008
1984	19,545,682	1,570,724	12,446,198	5,259,821	1,796,794	1,308,023	927,474	103,800	98,876	37,479	43,094,871
1985	20,125,177	1,193,881	13,702,702	5,140,131	1,381,029	1,240,928	1,079,723	118,500	82,295	42,881	44,107,247
1986	19,704,317	941,100	12,496,125	5,667,940	1,253,687	1,416,929	1,123,008	109,000	57,593	93,105	42,862,804
1987	19,747,766	1,256,170	12,856,301	5,317,302	1,571,811	1,146,613	1,397,138	84,100	49,820	60,241	43,487,262
1988	21,739,067	1,118,900	12,977,313	4,758,990	1,923,283	1,779,908	1,557,222	66,200	22,966	53,696	45,997,545
1989	23,368,719	1,430,347	15,645,964	5,786,810	2,076,851	2,344,932	2,059,800	76,500	17,502	45,107	52,852,532
1990	28,068,238	1,658,200	16,572,172	7,258,175	2,645,951	3,431,111	2,198,867	68,300	24,941	58,260	61,984,215
1991	30,788,646	1,802,035	15,998,463	7,445,172	2,673,674	3,128,246	1,673,031	54,700	26,445	7,914	63,598,326
1992	26,830,448	1,529,292	14,969,350	6,763,087	2,534,161	2,651,067	1,213,255	21,000	27,279	753	56,539,692
1993	29,926,464	1,693,347	14,350,595	6,228,470	2,177,022	2,667,107	906,498	24,000	46,650	2,940	58,023,093
1994	38,948,867	1,650,751	16,176,551	6,474,399	2,146,339	3,954,634	581,396	8,400	7,992	460	69,949,789
1995	37,208,324	1,834,794	15,903,241	5,362,084	2,541,140	6,653,780	606,011	25,100	26,955	5,210	70,166,639
1996	36,083,443	1,632,829	15,312,826	5,295,797	2,888,683	9,408,519	640,198	20,496	28,726	C	71,311,517
1997	47,023,271	1,414,133	15,010,532	5,798,529	3,468,051	8,878,395	858,426	C	34,208	2,240	82,487,785
1998	47,036,836	1,194,653	13,167,803	5,617,873	3,715,310	7,896,803	721,811	1,359	19,266	1,306	79,373,020
1999	53,494,418	1,380,360	15,875,031	8,155,947	2,595,764	6,452,472	931,064	C	41,954	6,916	88,933,926
2000	57,215,406	1,709,746	14,988,031	6,907,504	1,393,565	2,883,468	891,183	C	62,416	C	86,051,319
2001	48,617,693	2,027,725	11,976,487	4,452,358	1,329,707	2,052,741	579,753	C	31,114	C	71,067,578
2002	63,625,745	2,029,887	13,437,109	3,835,050	1,067,121	1,440,483	264,425	C	20,489	C	85,720,309
2003	54,970,948	1,958,817	11,321,324	3,561,391	C	946,449	209,956	C	22,778	C	72,991,663
2004	71,574,344	2,851,262	11,675,852	3,059,319	646,994	996,109	370,536	13,322	14,931	27,039	91,229,708
2005	68,729,623	C	11,291,145	3,174,852	713,901	1,154,470	369,003	C	39,173	21,988	85,494,155
2006	75,419,802	2,612,389	12,090,423	3,949,299	806,135	1,252,146	470,878	3,706	26,349	28,160	96,659,287
2007	63,987,073	2,468,811	10,046,120	2,299,744	568,696	911,761	334,097	C	26,804	C	80,643,106
2008	69,910,434	2,568,088	10,606,534	2,782,000	427,168	712,075	304,479	C	32,932	C	87,343,709
2009	81,124,201	2,986,981	11,789,536	2,842,088	412,468	731,811	C	6,064	30,988	21,472	99,945,239
2010	96,244,299	3,648,004	12,772,159	2,928,688	441,622	813,513	692,869	C	29,989	16,345	117,586,675
2011	104,957,224	3,919,195	13,385,393	2,754,067	198,928	344,232	697,883	8,879	41,077	12,879	126,320,059
2012	127,464,332	4,229,227	14,486,344	2,706,384	247,857	550,441	919,351	C	65,813	10,823	150,680,338
2013	128,015,530	3,817,707	15,158,509	2,155,762	127,420	496,535	660,367	C	62,522	9,061	150,503,413
2014	124,941,217	4,374,656	15,312,852	2,412,875	127,409	222,843	526,368	26,330	57,414	11,099	148,013,063
2015	122,685,803	4,721,826	16,450,414	2,315,708	205,099	147,414	445,060	22,894	29,284	9,474	147,032,976
2016	132,750,484	5,782,098	17,784,921	2,260,335	254,346	218,846	349,880	C	29,254	2,854	159,433,017
2017	112,170,139	5,513,999	16,493,125	2,031,143	130,015	150,317	409,062	32,364	29,136	1,630	137,091,350
2018	121,226,213	6,199,365	17,697,243	1,905,689	110,580	112,685	344,547	C	24,893	2,727	147,623,943
2019	101,987,215	6,093,615	17,029,462	1,795,212	111,573	112,107	291,072	C	C	1,840	127,422,095
2020	97,910,036	5,013,785	15,711,553	1,695,279	159,173	111,678	309,197	C	10,176	C	120,920,877
2021	109,528,524	5,709,116	17,051,592	1,352,470	95,993	119,990	323,205	C	12,816	2,917	134,196,623

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Table 2. Above: Current (2016-2018) reference abundance estimates (millions), current target and threshold abundance (millions), and new recommended abundance reference points for both stocks. Below: Current (2016-2018) exploitation, current target and threshold exploitation, and new recommended target and threshold exploitation for both stocks.

Quantity	GOMGBK	SNE
Current (2016-2018 average)	256	7
Current Target	119	32
Current Threshold	58	25
Fishery/Industry Target	212	NA
Abundance Limit	125	NA
Abundance Threshold	89	20

Quantity	GOMGBK	SNE
Current (2016-2018 average)	0.459	0.274
Current Target	0.457	0.379
Current Threshold	0.510	0.437
Recommended Target	0.461	0.257
Recommended Threshold	0.475	0.290

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Table 3. 2021 LCMA specific management measures

Management Measure	LCMA 1	LCMA 2	LCMA 3	LCMA 4	LCMA 5	LCMA 6	OCC
Min Gauge Size	3 1/4"	3 3/8"	3 17/32 "	3 3/8"	3 3/8"	3 3/8"	3 3/8"
Vent Rect.	1 15/16 x 5 3/4"	2 x 5 3/4"	2 1/16 x 5 3/4"	2 x 5 3/4"	2 x 5 3/4"	2 x 5 3/4"	2 x 5 3/4"
Vent Cir.	2 7/16"	2 5/8"	2 11/16"	2 5/8"	2 5/8"	2 5/8"	2 5/8"
V-notch requirement	Mandatory for all eggers	Mandatory for all legal size eggers	Mandatory for all eggers above 42°30'	Mandatory for all eggers in federal waters. No v-notching in state waters.	Mandatory for all eggers	None	None
V-Notch Definition¹ (possession)	Zero Tolerance	1/8" with or w/out setal hairs ¹	1/8" with or w/out setal hairs ¹	1/8" with or w/out setal hairs ¹	1/8" with or w/out setal hairs ¹	1/8" with or w/out setal hairs ¹	State Permitted fisherman in state waters 1/4" without setal hairs Federal Permit holders 1/8" with or w/out setal hairs ¹
Max. Gauge (male & female)	5"	5 1/4"	6 3/4"	5 1/4"	5 1/4"	5 1/4"	State Waters none Federal Waters 6 3/4"
Season Closure				April 30- May 31 ²	February 1- March 31 ³	Sept 8- Nov 28 ⁴	February 1- April 30

¹ A v-notched lobster is defined as any female lobster that bears a notch or indentation in the base of the flipper that is at least as deep as 1/8", with or without setal hairs. It also means any female which is mutilated in a manner that could hide, obscure, or obliterate such a mark.

² Pots must be removed from the water by April 30 and un-baited lobster traps may be set one week prior to the season reopening.

³ During the February 1 – March 31 closure, trap fishermen will have a two week period to remove lobster traps from the water and may set lobster traps one week prior to the end of the closed season.

⁴ Two week gear removal and a 2 week grace period for gear removal at beginning of closure. No lobster traps may be baited more than 1 week prior to season reopening.

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Table 4. Summary of Area 2 Trap Transfers, Annual Reductions, and Conservation Tax, 2015-2020*

Application Year	Total Trap Allocation	Annual Trap Reductions	Number of Traps Transferred Out	10% Tax on Trap Transfers	Number of Traps Transferred In	Trap Loss from Cap Limits, Renew or Lose, or Leveling	Balance at the Start of the Next Fishing Year
2015	118,188	29,524	7,050	705	6,345	0	87,959
2016	87,959	4,339	4,140	414	3,726	8	83,198
2017	83,198	4,067	4,020	402	3,618	5	78,724
2018	78,724	3,865	1,780	178	1,602	100	74,581
2019	74,581	3,729	3,694	369	3,325	0	70,483*
2020	70,483*	3,524	1,320	132	1,188	0	66,827*
2021	66,827	N/A	2,651	264	2,387	0	66,563
Grand Total	N/A	49,048	24,655	2,464	22,191	113	N/A

* Prior calculation errors were identified and corrected. These numbers will differ from past information provided.

Table 5. Summary of Area 3 Trap Transfers, Annual Reductions, and Conservation Tax, 2015-2020*

Application Year	Total Trap Allocation	Annual Trap Reductions	Number of Traps Transferred Out	10% Tax on Trap Transfers	Number of Traps Transferred In	Trap Loss from Cap Limits, Renew or Lose, or Leveling	Balance at the Start of the Next Fishing Year
2015	145,433	7,201	13,612	1,363	12,249	1	136,868
2016	136,868	6,779	11,650	1,165	10,485	14	128,910
2017	128,910	6,391	7,130	713	6,417	0	121,806
2018	121,806	6,036	2,820	282	2,538	9	115,479
2019	115,479	5,774	4,060	406	3,654	0	109,299*
2020	109,299*	N/A	2,430	243	2,187	9	109,047*
2021	109,047	N/A	5,054	505	4,549	0	108,542
Grand Total	N/A	32,181	46,756	4,677	42,079	33	N/A

* Prior calculation errors were identified and corrected. These numbers will differ from past information provided.

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Table 6. 2020 sampling requirements and state implementation. All states have 100% active harvester reporting except for Maine which has 10% harvester reporting. Sufficient sea sampling can replace port sampling. *De minimis* states (denoted by *) are not required to conduct biological sampling of their lobster fishery.

State	100% Dealer Reporting	10% Harvester Reporting	Sea Sampling	Port Sampling	Ventless Trap Survey	Settlement Survey	Trawl Survey
ME	✓	✓ (10%)	✓		✓	✓	✓
NH	✓	✓	✓	✓	✓	✓	✓
MA	✓	✓	✓		✓	✓	^a
RI	✓	✓	^a	✓	✓	✓	✓
CT	✓	✓	^b	^b		^c	✓
NY	✓	✓	✓	✓			✓
NJ	✓	✓	^a				^a
DE*	✓	✓			✓		✓
MD*	✓	✓					✓
VA*	✓	✓					

^a Sampling hindered or not completed due to the COVID-19 pandemic

^b No fishery dependent sampling has been conducted by CT since 2014 due to reductions in funding and staffing levels.

^c Larval data are available for the eastern Sound (ELIS) from the Millstone Power Station entrainment estimates of all stages of lobster larvae (Dominion Nuclear CT, Annual Report 2016).

Table 7. 2021 sea and port sampling trips and samples by state. *De minimis* states (denoted by *) are not required to conduct biological sampling of their lobster fishery.

State	Sea Sampling			Port Sampling		Market Sampling		Totals	
	Trips	Samples	Traps	Trips	Samples	Trips	Samples	Trips	Samples
ME	149	183,154	183,154					149	183,154
NH	13	7,252		11	1,100			24	8,352
MA	57	22,604		0	0	0	0	57	22,604
RI	2	1,073		9	2,115			11	3,188
CT	0	0	0	0	0	0	0	0	0
NY	0	0	0	18	1,838			18	1,838
NJ	0	0	0	0	0	0	0	0	0
DE*	NA	NA	NA	NA	NA	NA	NA	0	0
MD*	NA	NA	NA	NA	NA	NA	NA	0	0
VA*	NA	NA	NA	NA	NA	NA	NA	0	0
Total	221	214,083	183,154	38	5,053	0	0	259	219,136

15.0 Figures

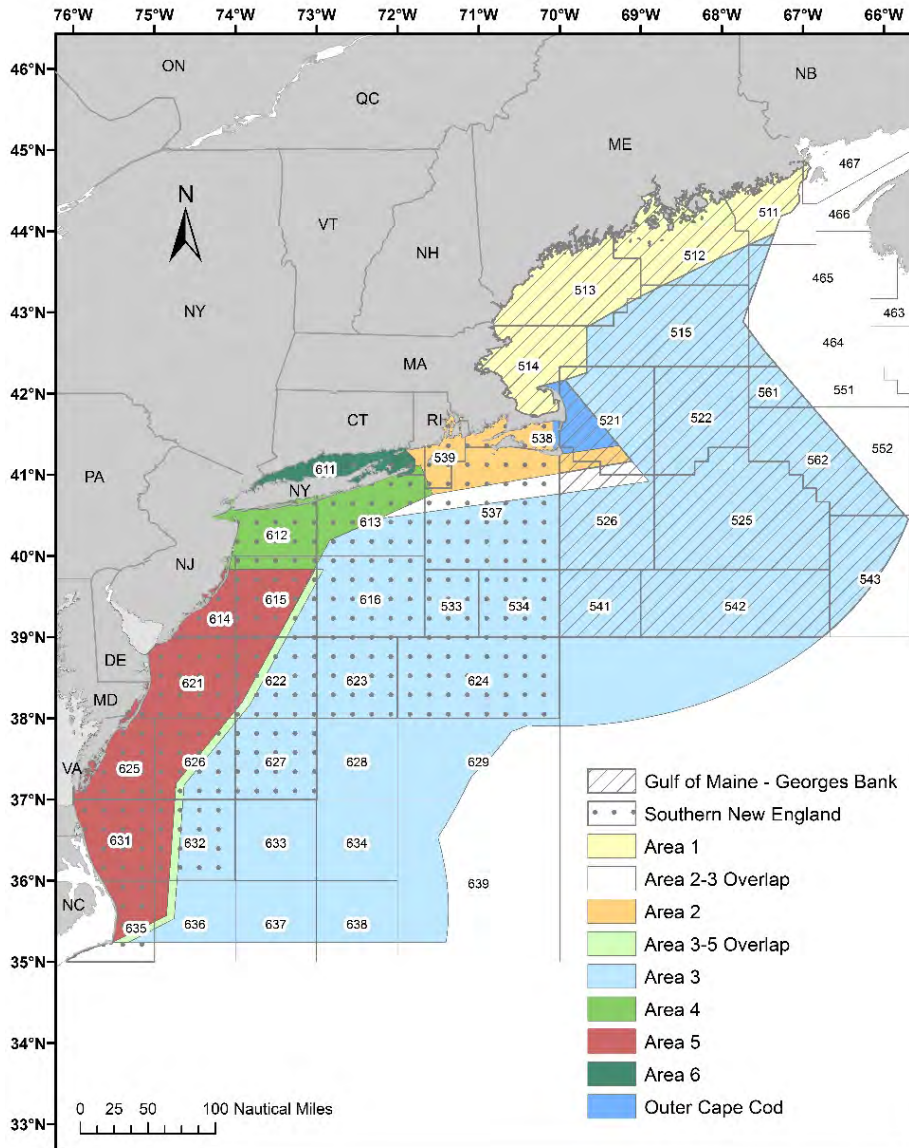


Figure 1. Lobster Conservation Management Areas (LCMAs) and stock boundaries for American lobster.

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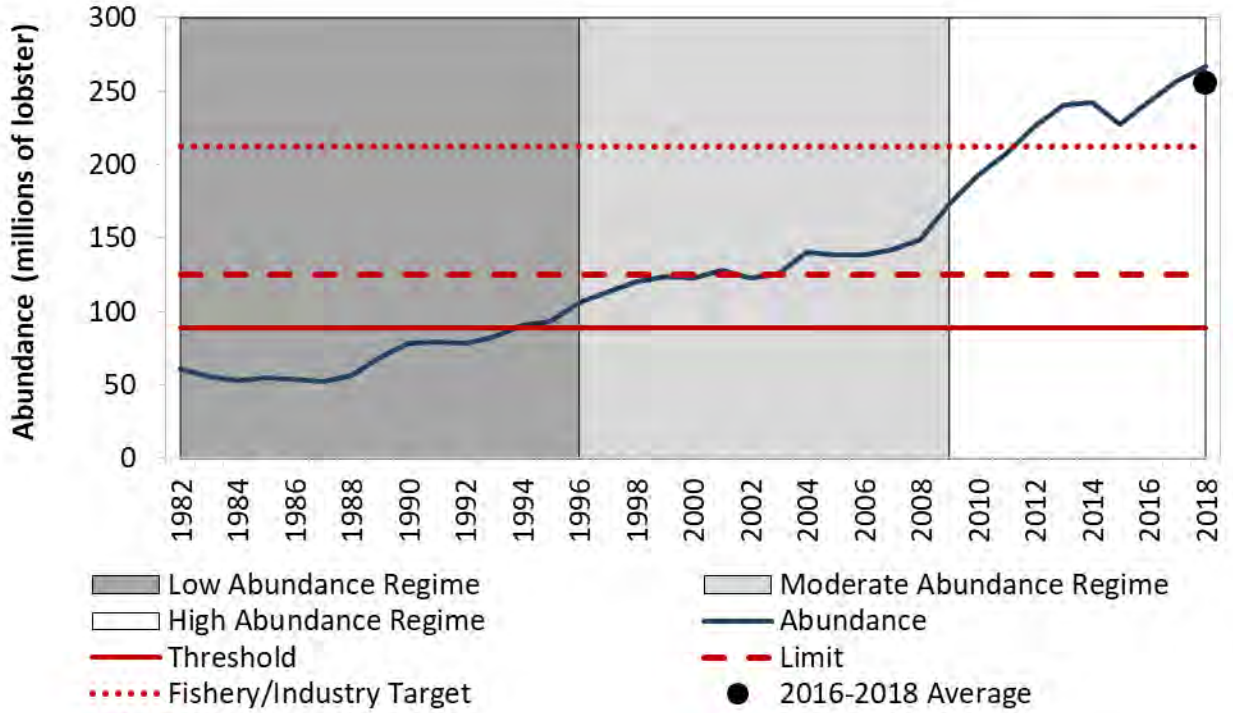


Figure 2. Abundance for GOM/GBK Relative to Reference Points. Source: 2020 Benchmark Stock Assessment for American Lobster.

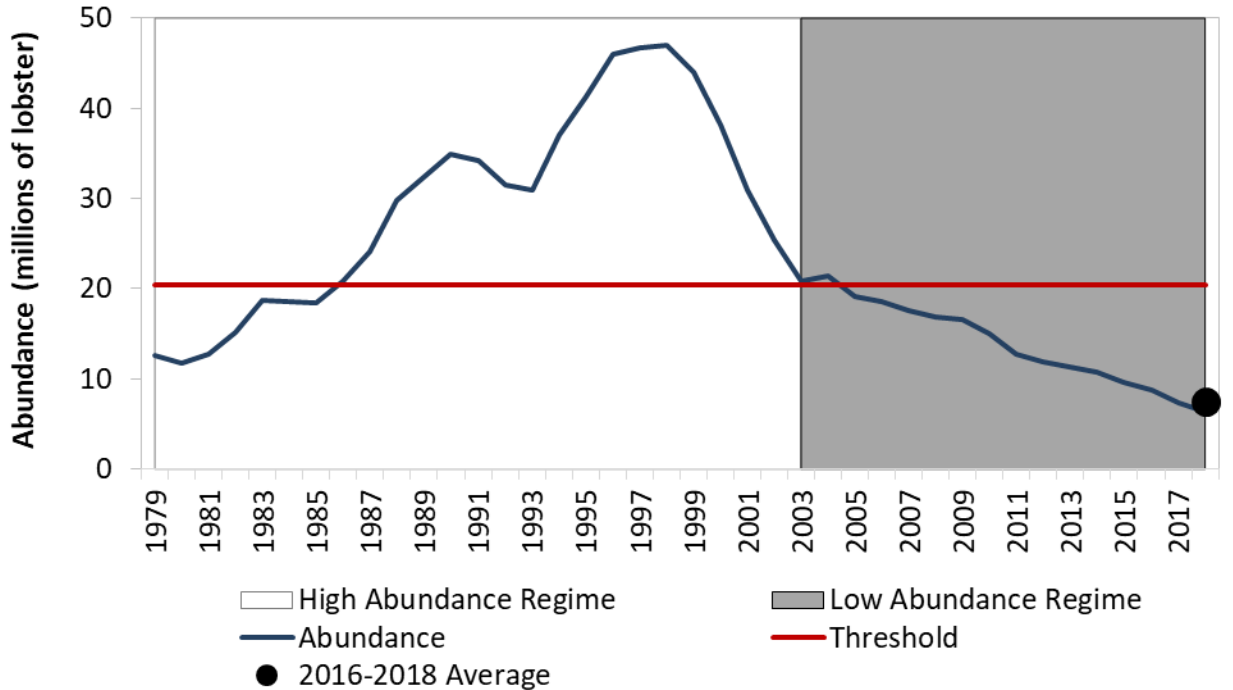


Figure 3. Abundance for SNE Relative to Reference Points. Source: 2020 Benchmark Stock Assessment for American Lobster.

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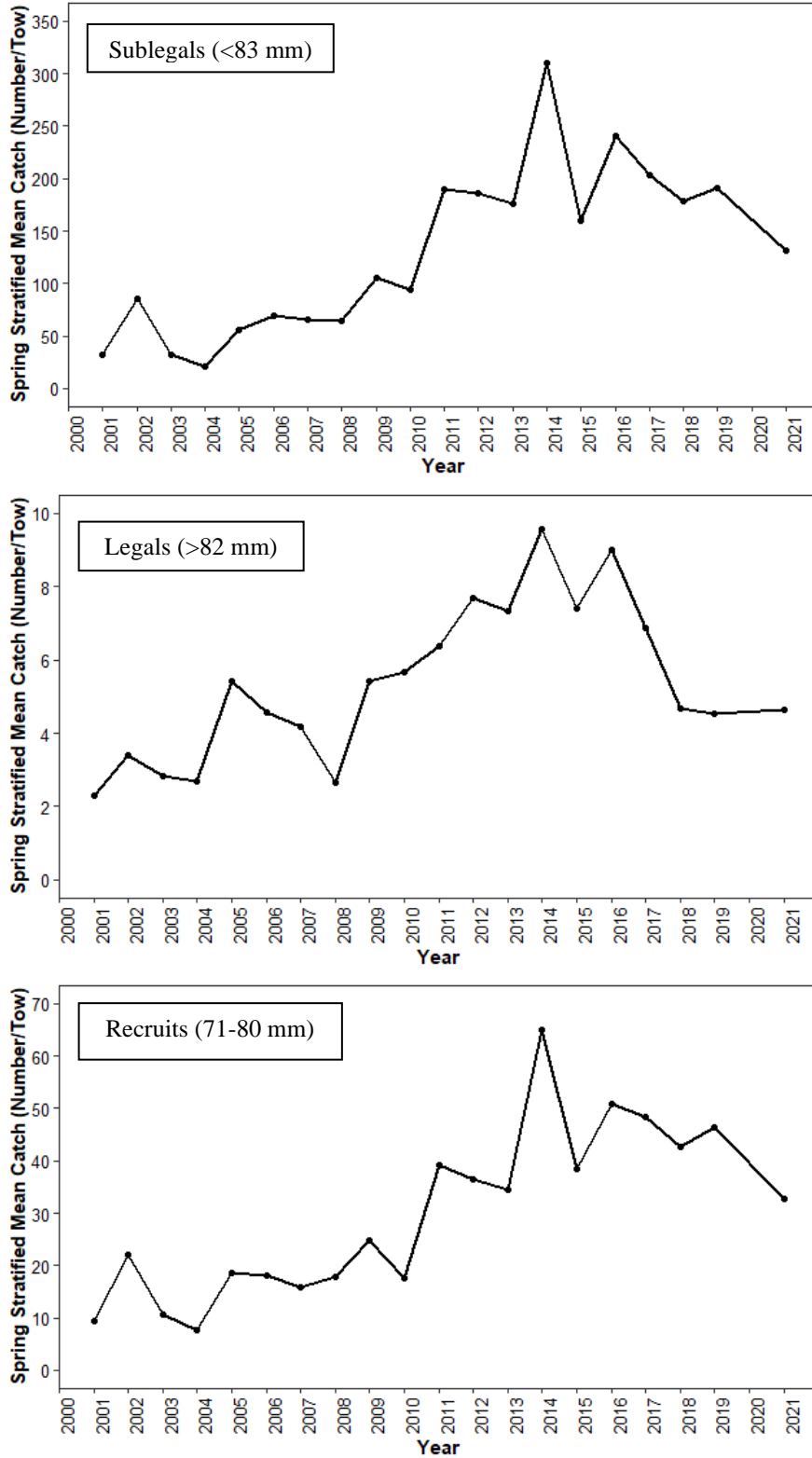


Figure 4. Stratified mean catch and recruit abundance for American lobster on the Spring ME/NH Inshore Trawl Survey (2000-2021).

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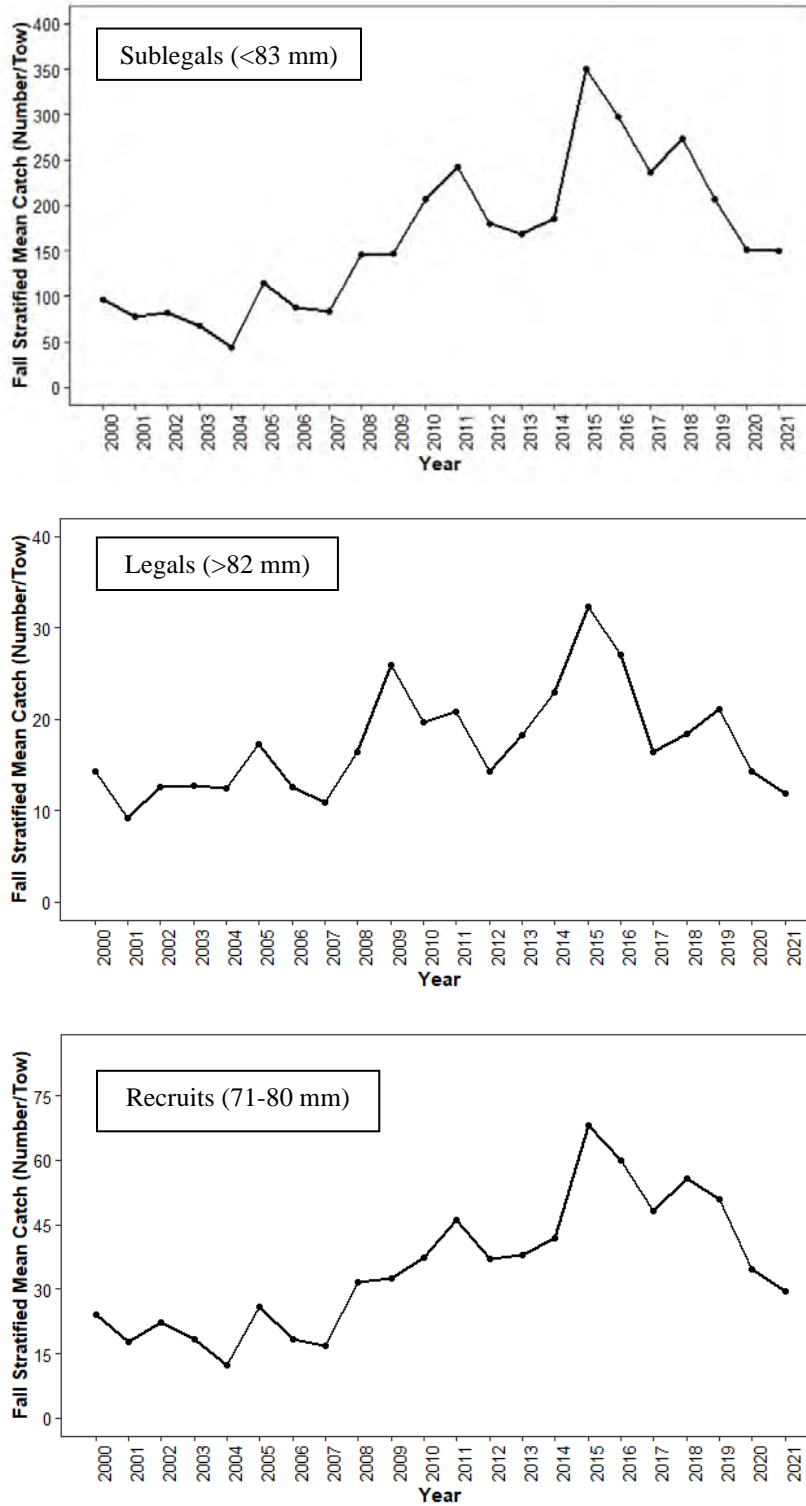


Figure 5. Stratified mean catch and recruit abundance for American lobster on the Fall ME/NH Inshore Trawl Survey (2000-2021).

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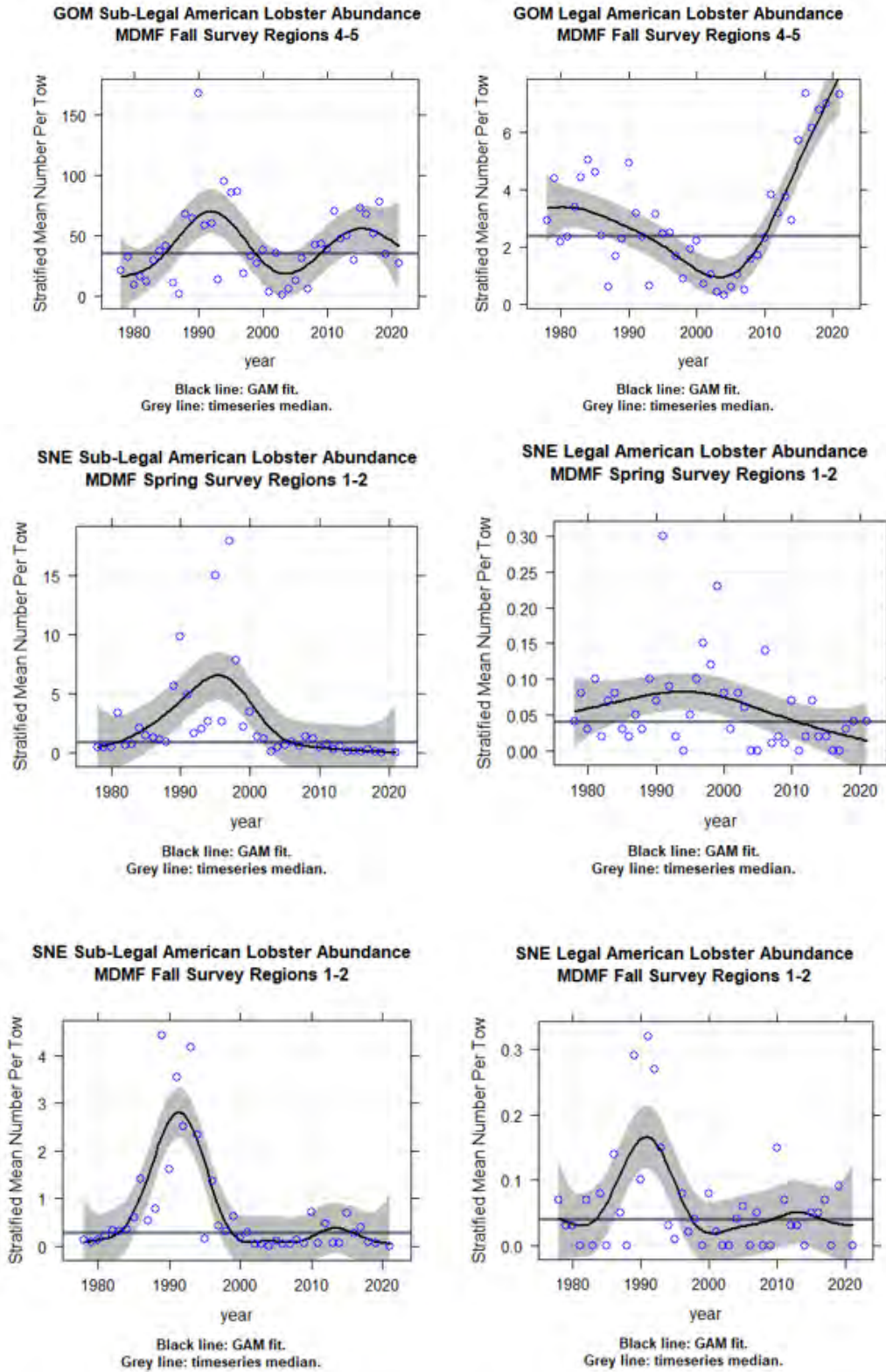


Figure 6. MADMDF Fall Trawl Survey sublegal (left) and legal (right) indices from 1978-2019 sexes combined. The top two charts are from Gulf of Maine and the bottom four charts are from Southern New England.

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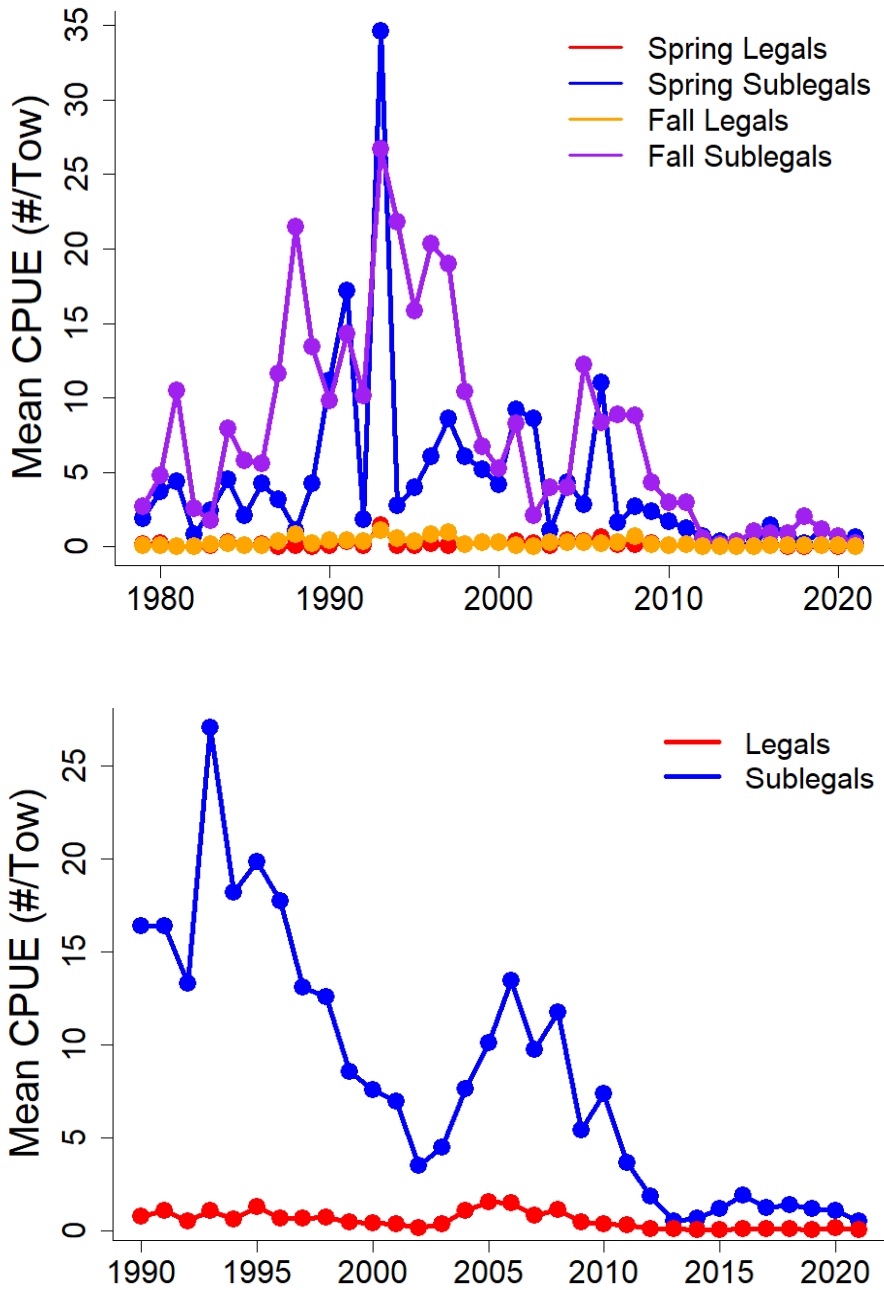


Figure 7. RIDFW Seasonal (spring and fall) Trawl lobster abundances (top) and Monthly Trawl lobster abundances (bottom). CPUE is expressed as the annual mean number per tow for sub-legal (<85.725mm CL) and legal sized (>=85.725mm CL) lobsters.

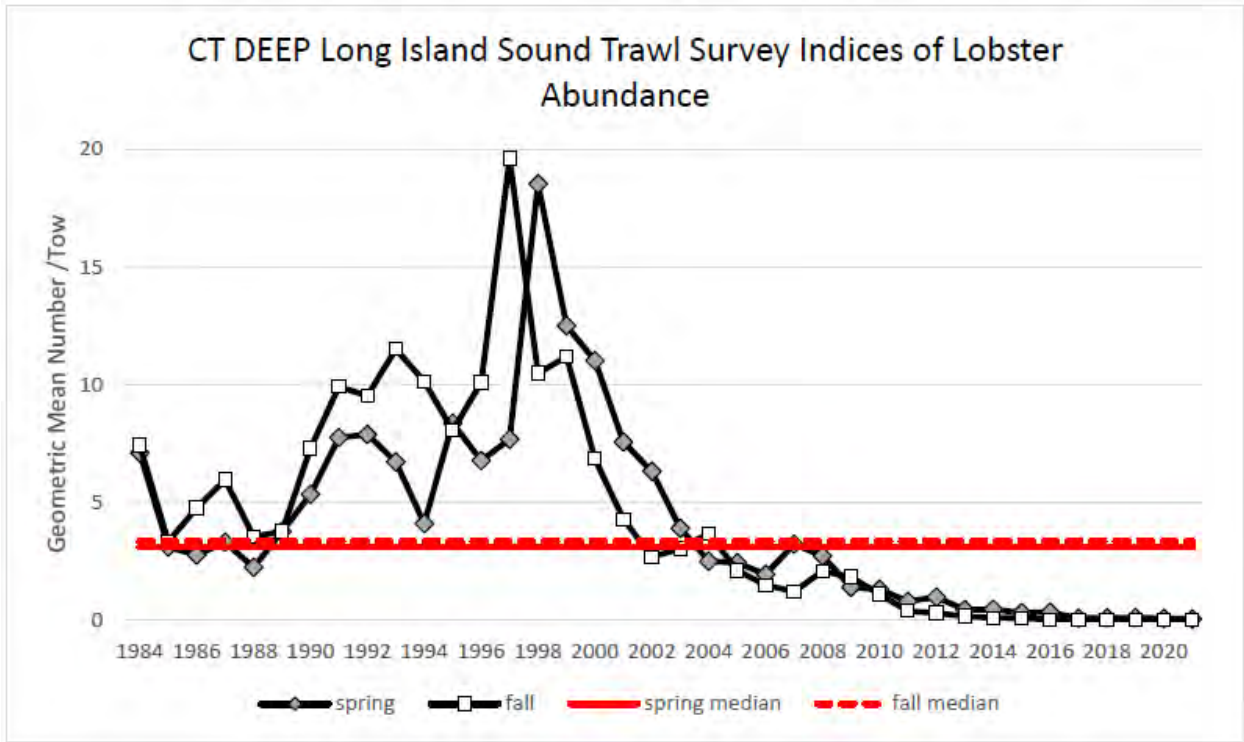


Figure 8. Results of the Long Island Sound Trawl Survey during spring (April-June) and fall (September-October) within NMFS statistical area 611.

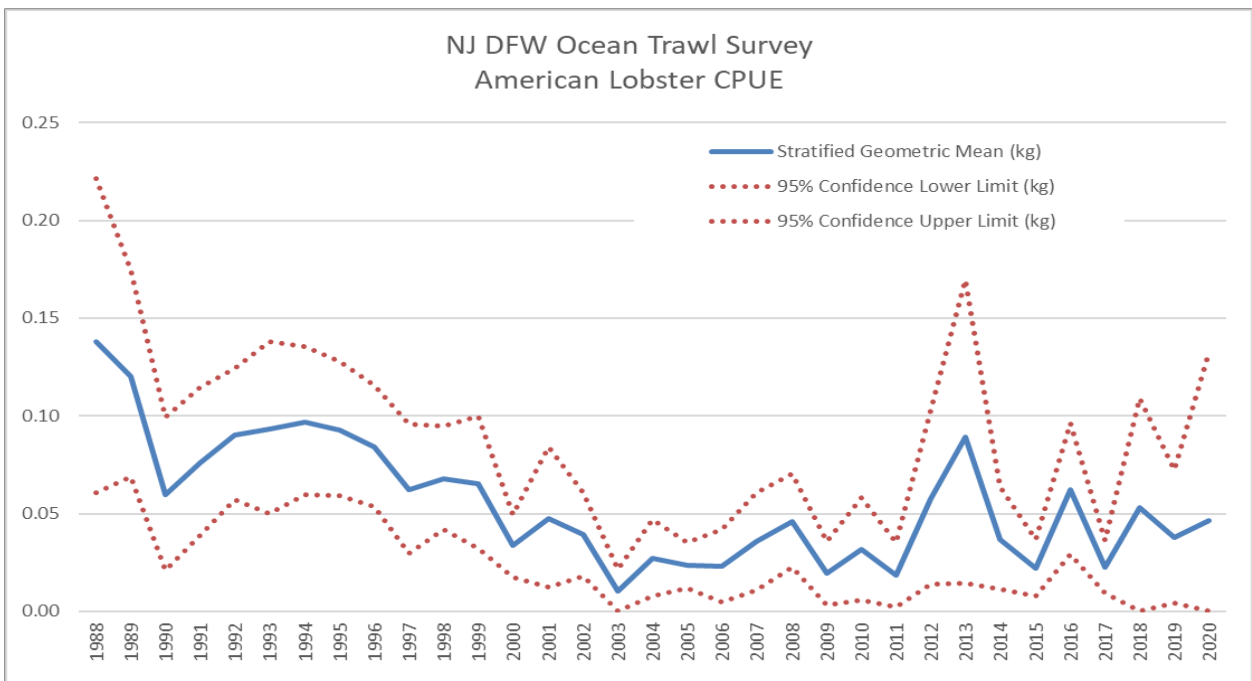


Figure 9. Stratified mean CPUE of all lobsters collected aboard the NJDFW Ocean Trawl Survey. *NOTE: No April 2019 Survey was conducted due to Research vessel mechanical issues. Due to the COVID-19 pandemic, 2020 and 2021 CPUE and indices were not obtained.

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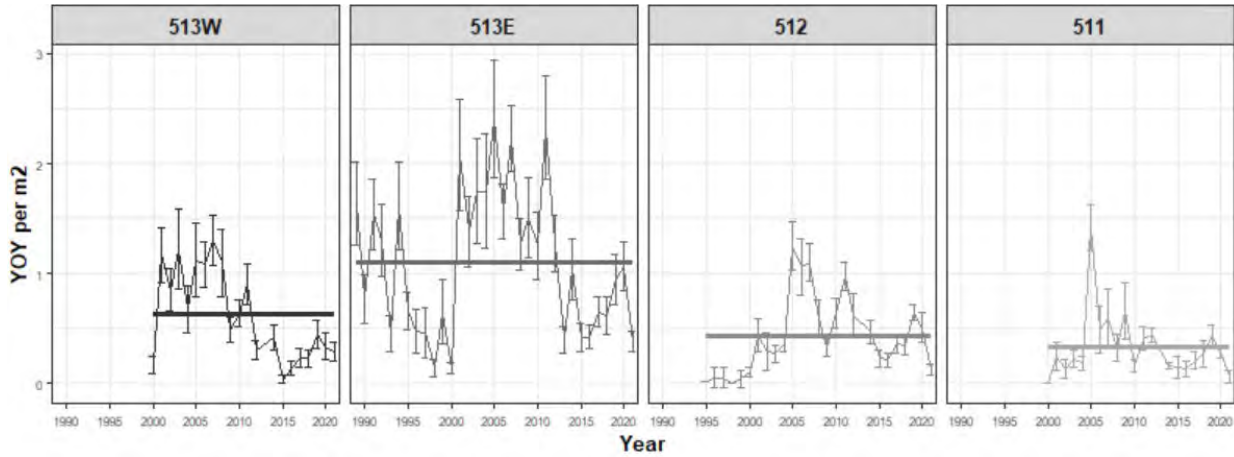


Figure 10. Maine Settlement Survey index 1989-2021 for each statistical area with series average (solid horizontal line) for each region with standard error bars.

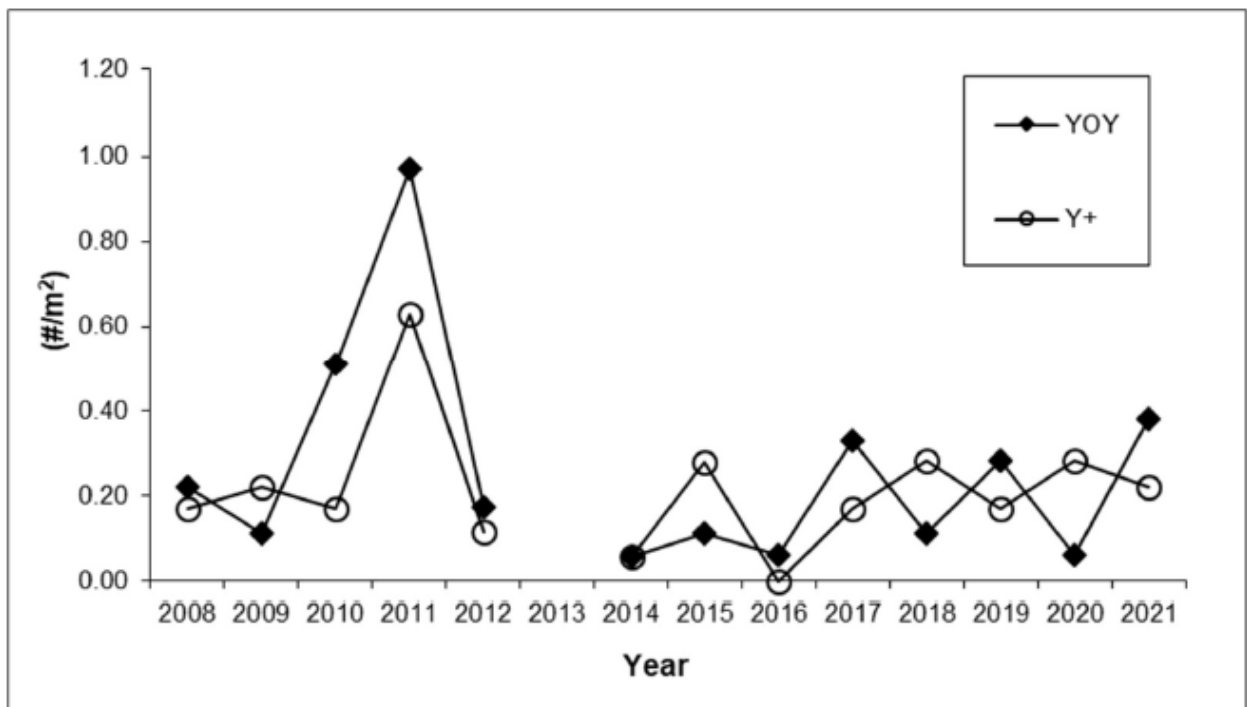


Figure 11. Catch per unit effort (#/m²) of young-of-year (YOY), one-year-olds (Y+), YOY and Y+ combined, and all lobsters during the American Lobster Settlement Index, by location, in New Hampshire, from 2008 through 2021.

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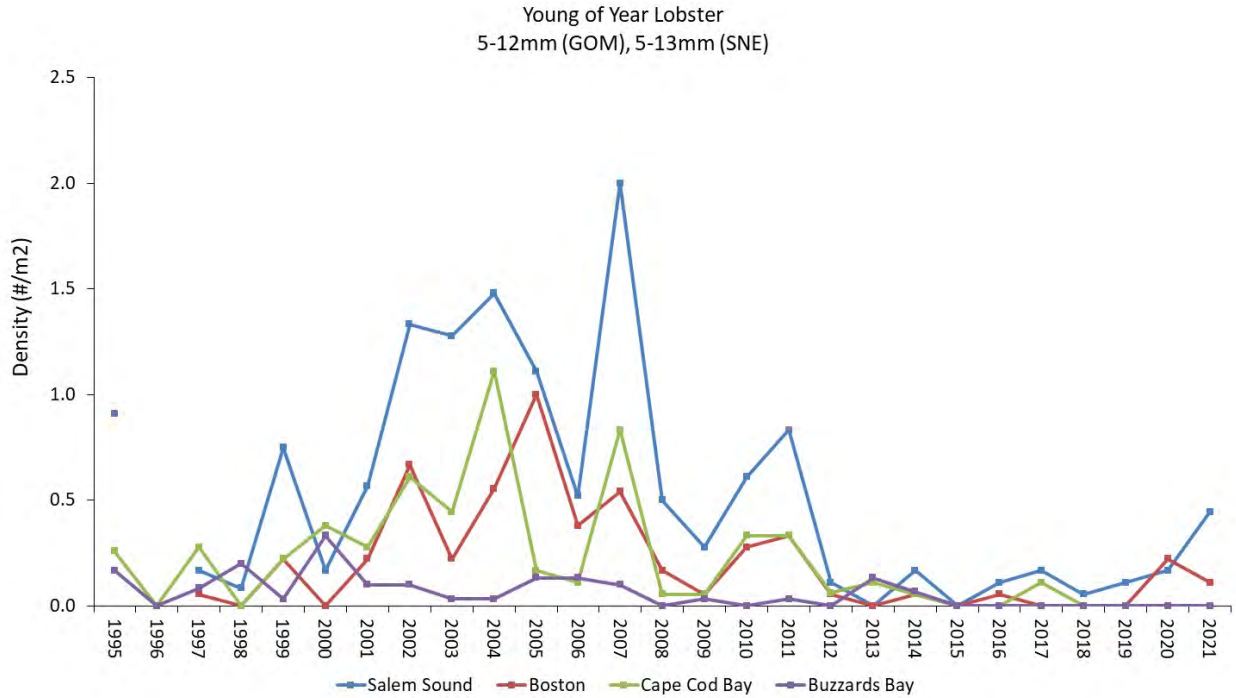


Figure 12. Young-of-year lobster density in four Massachusetts regions used in the stock assessment; LCMA 1 – Salem Sound, Boston, Cape Cod Bay, LCMA 2 - Buzzards Bay. Note that Cape Cod Bay sites were discontinued in 2019 due to white shark risk.

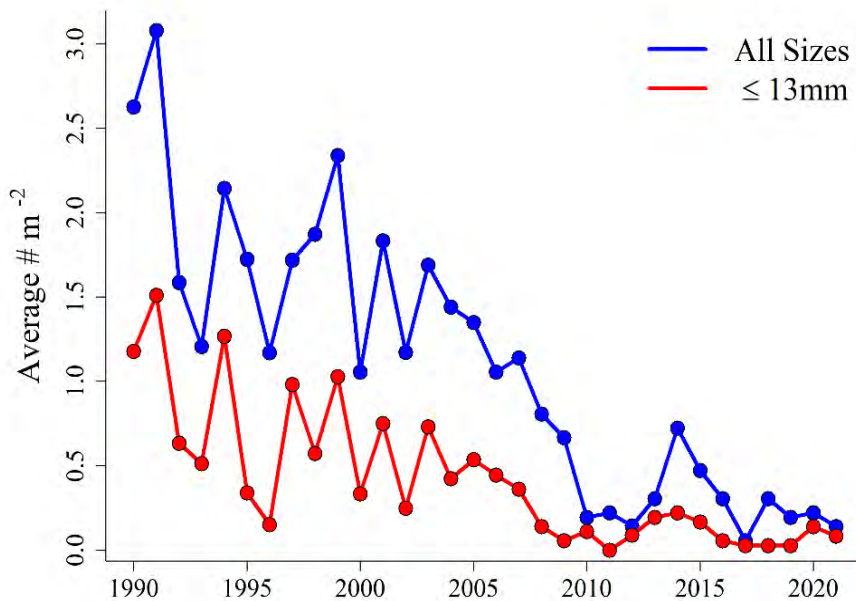


Figure 13. Average abundance of American lobster in Rhode Island suction sampling sites. Abundances are presented for YOY lobsters 12mm and smaller (red line) and all sizes (blue line).

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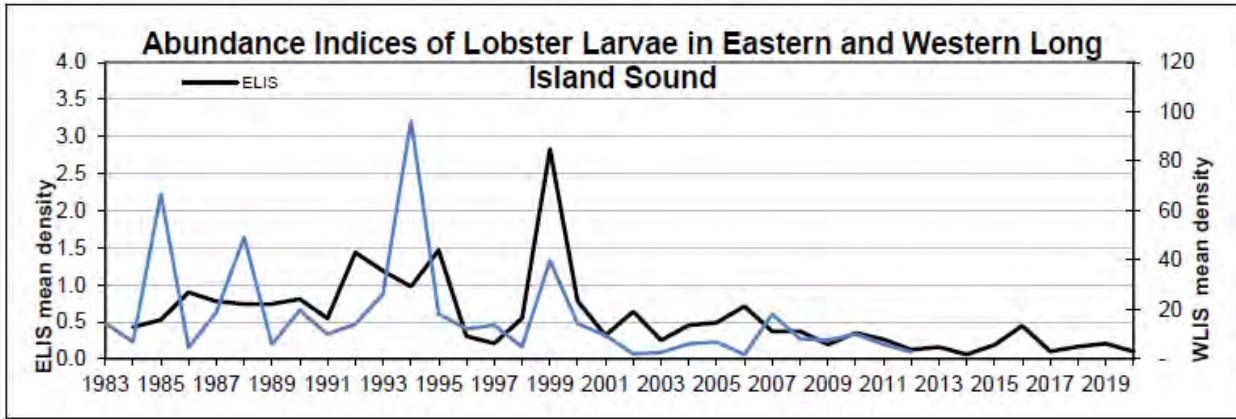


Figure 14. Abundance indices of lobster larvae from the Connecticut DEEP Larval Lobster Survey in western Long Island Sound and from the Millstone Power Station entrainment estimates in eastern Long Island Sound. The Connecticut DEEP survey was discontinued in 2013.

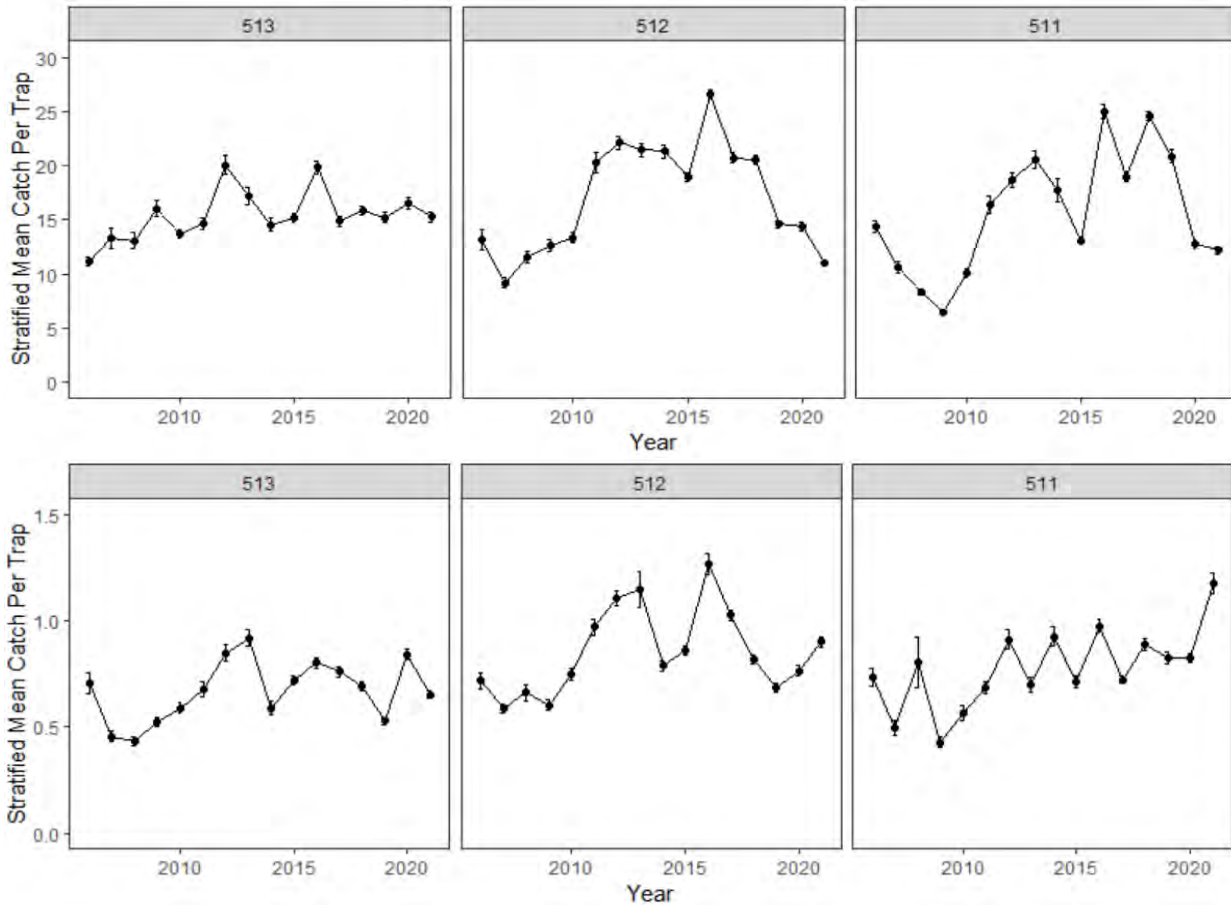


Figure 15. Stratified mean catch per trap for sublegal (top) and legal (bottom) sized lobsters from Maine’s Ventless Trap Survey 2006-2021 by statistical area from ventless traps only. Standard error is shown.

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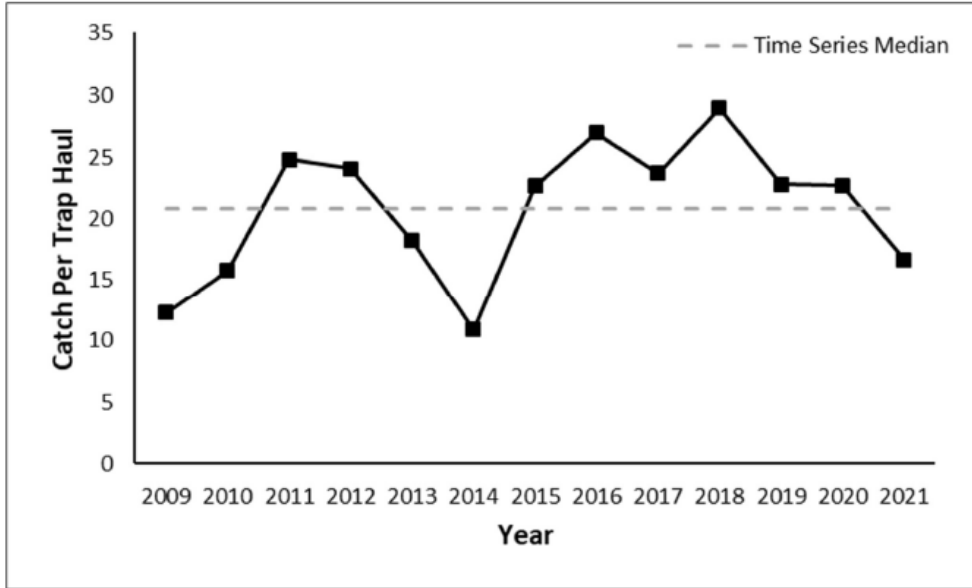


Figure 16. Stratified mean catch per trap haul (ventless traps only) for all lobsters captured during the coast-wide random stratified Ventless Trap Survey in New Hampshire state waters from 2009 through 2021.

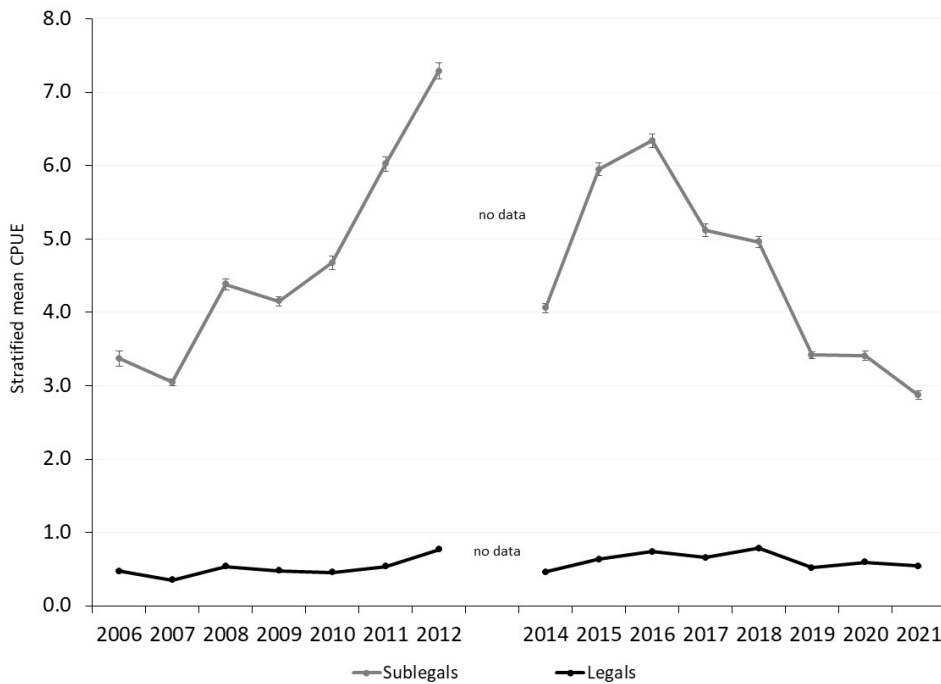


Figure 17. Stratified mean catch per trap haul (\pm S.E.) of sublegal (< 83 mm, grey line) and legal (\geq 83 mm, black line) lobsters in NMFS Area 514 from MADMF ventless trap survey from 2006-2021.

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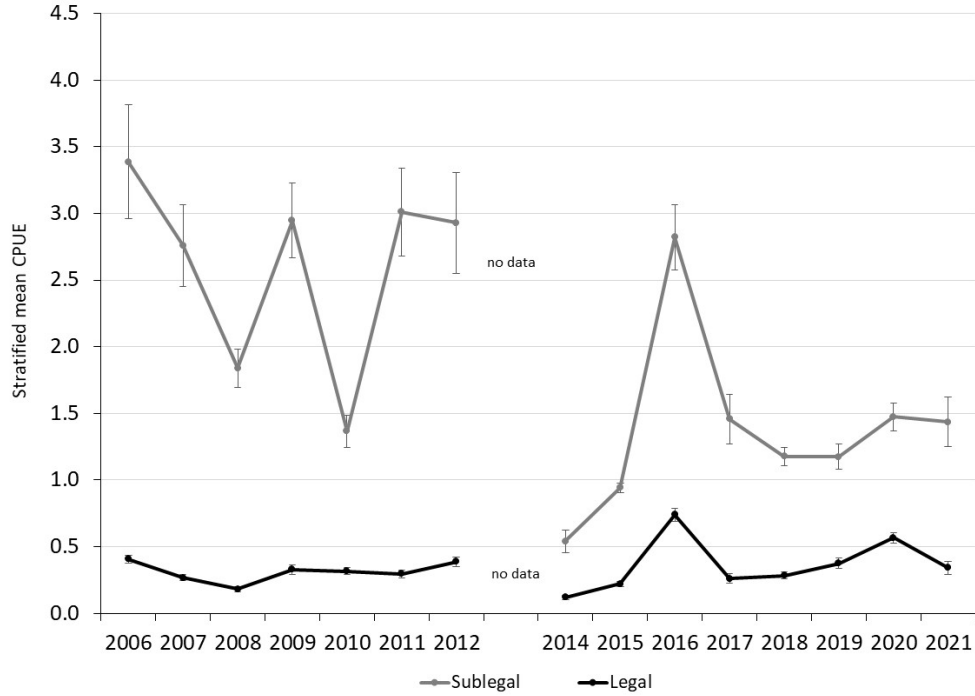


Figure 18. Stratified mean catch per trap haul (\pm S.E.) of sublegal (< 86 mm, grey line) and legal (\geq 86 mm, black line) lobsters in the reduced MA SNE survey area, Area 538.

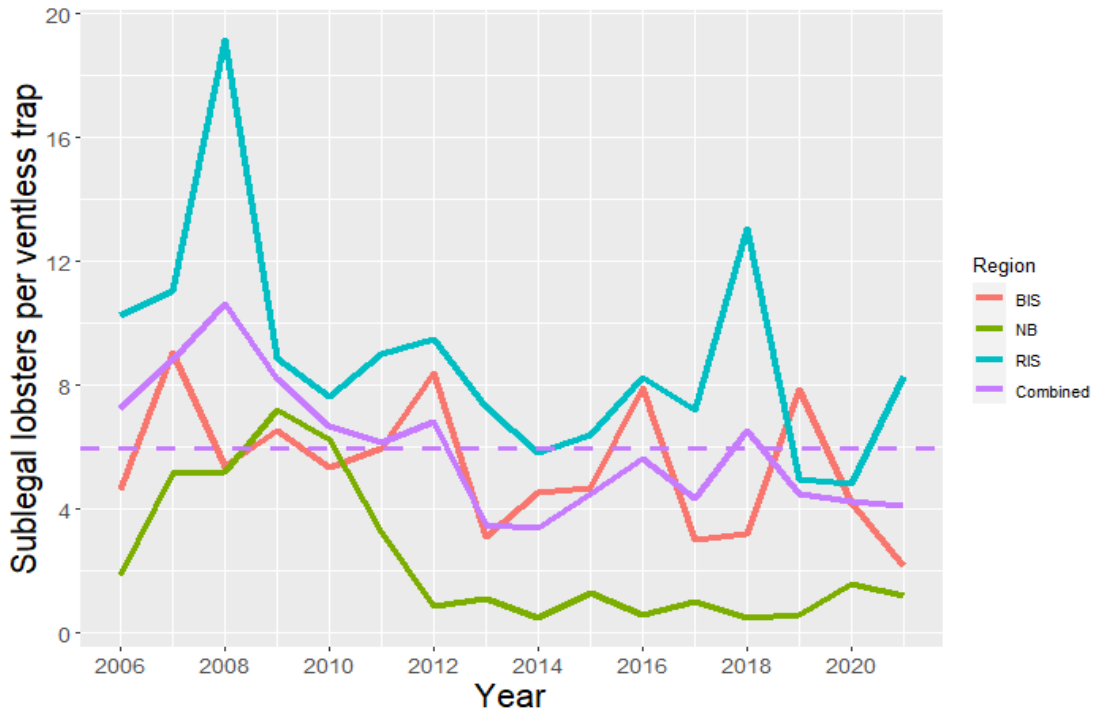


Figure 19. Depth-stratified mean catch of sublegal lobsters in the RIDEM DMF ventless trap survey, 2006-2021.

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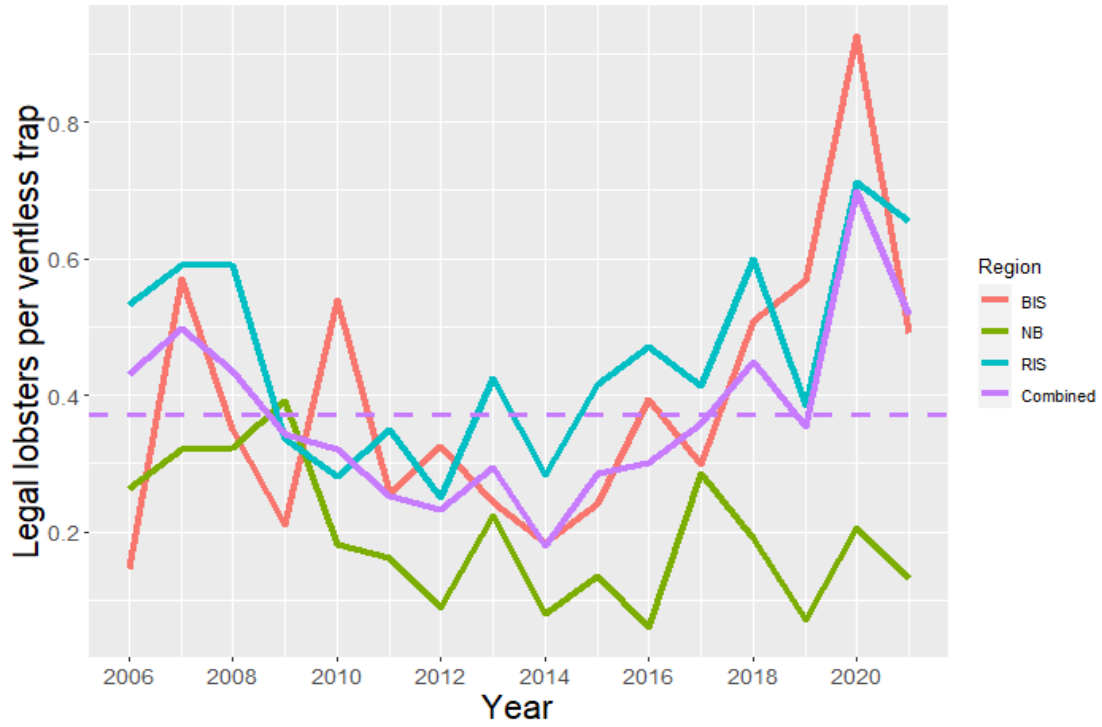


Figure 20. Depth-stratified mean catch of sublegal lobsters in the RIDEM DMF ventless trap survey, 2006-2021.

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ATLANTIC STATES MARINE FISHERIES COMMISSION
REVIEW OF THE INTERSTATE FISHERY MANAGEMENT PLAN

**For Jonah Crab
(*Cancer borealis*)**

2021 FISHING YEAR



Prepared by the Plan Review Team

October 2022



Sustainable and Cooperative Management of Atlantic Coastal Fisheries

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**REVIEW OF THE ATLANTIC STATES MARINE FISHERIES COMMISSION FISHERY MANAGEMENT
PLAN FOR JONAH CRAB (*Cancer borealis*)**

2021 FISHING YEAR

1.0 Status of the Fishery Management Plan

<u>Year of ASMFC Plan’s Adoption:</u>	FMP (2015)
<u>Framework Adjustments:</u>	Addendum I (2016) Addendum II (2017) Addendum III (2018) Addendum IV (2022)
<u>Management Unit:</u>	Maine through North Carolina
<u>States with a Declared Interest:</u>	Maine through Virginia (Excluding Pennsylvania and DC)
<u>Active Committees:</u>	American Lobster Management Board, Technical Committee, Plan Review Team, Advisory Panel, Electronic Reporting Subcommittee, Electronic Tracking Subcommittee

2.0 Status of the Fishery

2.1 Commercial Fishery

Historically, Jonah crab was taken as bycatch in the lobster fishery; however, in recent years a directed fishery has emerged causing landings to rapidly increase. Throughout the 1990s, landings fluctuated between approximately 2 and 3 million pounds, and the overall value of the fishery was low. In the early 2000’s landings began to increase, with over 7 million pounds landed in 2005. By 2014, landings had almost tripled to 17 million pounds and a value of nearly \$13 million. This rapid increase in landings can be attributed to an increase in the price of other crab (such as Dungeness), creating a substitute market for Jonah crab, as well as a decrease in the abundance of lobsters in Southern New England, causing fishermen to redirect effort on Jonah crab. It should be noted that there is some uncertainty in the landings data—especially prior to 2008—due to species misidentification issues as well as underreporting of landings before the implementation of reporting requirements. Despite the uncertainty, the overall trend in landings is likely accurate.

Today, Jonah crab and lobster are considered a mixed crustacean fishery in which fishermen can target lobster or crab at different times of the year based on slight gear modifications and small shifts in the areas in which the traps are fished. While the majority of Jonah crab landings is harvested as whole crabs, fishermen from several states, including New York, Maryland and Virginia, land claws. Jonah crab claws are relatively large and can be an inexpensive substitute for stone crab claws. As a result, they can provide an important source of income for fishermen.

Along the Delmarva Peninsula, small boat fishermen have historically harvested Jonah crab claws because they do not have seawater storage tanks on board to store whole crabs.

In 2021, landings along the Atlantic Coast totaled approximately 12.3 million pounds of Jonah crab, representing \$12.6 million in ex-vessel value. Landings decreased 9% from 2020 landings of 13.5 million pounds. The states of Massachusetts (53%), Maine (21%), and Rhode Island (17%) were the largest contributors to landings. Over 99% of 2020 coastwide landings came from trap gear.

2.2 Recreational Fishery

The magnitude of the Jonah crab recreational fishery is unknown at this time; however, it is believed to be quite small in comparison to the size of the commercial fishery.

3.0 Status of the Stock

Jonah crab are distributed in the waters of the Northwest Atlantic Ocean primarily from Newfoundland, Canada to Florida. The life cycle of Jonah crab is poorly described, and what is known is largely compiled from a patchwork of studies that have both targeted and incidentally documented the species. Female crab (and likely some males) are documented moving inshore during the late spring and summer. Motivations for this migration are unknown, but maturation, spawning, and molting have all been postulated. It is also generally accepted that these migrating crab move back offshore in the fall and winter. Due to the lack of a widespread and well-developed aging method for crustaceans, Jonah crab size-at-age, and age-at-maturity are poorly described.

The status of the Jonah crab resource is relatively unknown and no range-wide stock assessment has been conducted. Massachusetts, Rhode Island, Maine, and New Hampshire conduct inshore state water trawl surveys, and NOAA Fisheries conducts a trawl survey in federal waters which collects data on Jonah crab abundance and distribution. In addition, several studies are on-going (Section 7.0) to gather more information on the species. A Data Workshop took place in 2020 to evaluate all available data sources and determine whether enough data of sufficient quality are available to conduct a stock assessment. Based on the results of this workshop, in August 2021 the Board initiated a stock assessment for Jonah crab to be completed in 2023.

4.0 Status of Management Measures

Interstate Fishery Management Plan for Jonah Crab (2015)

Jonah crab is managed under the Interstate Fishery Management Plan (FMP) which was approved by the American Lobster Management Board in August 2015. The goal of the FMP is to promote conservation, reduce the possibility of recruitment failure, and allow for the full utilization of the resource by the industry. The FMP lays out specific management measures in the commercial fishery. These include a 4.75" minimum size and a prohibition on the retention of egg-bearing females. To prevent the fishery from being open access, the FMP states that participation in the directed trap fishery is limited to lobster permit holders or those who can prove a history of crab-only pot fishing. All others must obtain an incidental permit. In the

recreational fishery, the FMP sets a possession limit of 50 whole crabs per person per day and prohibits the retention of egg-bearing females. Due to the lack of data on the Jonah crab fishery, the FMP implements a fishery-dependent data collection program. The FMP also requires harvester and dealer reporting along with port and/or sea sampling.

Addendum I (2016)

Addendum I establishes a bycatch limit of 1,000 crabs per trip for non-trap gear (e.g., otter trawls, gillnets) and non-lobster trap gear (e.g., fish, crab, and whelk pots). In doing so, the Addendum caps incidental landings of Jonah crab across all non-directed gear types with a uniform bycatch allowance. While the gear types in Addendum I make minimal contributions to total landings in the fishery, the 1,000 crab limit provides a cap to potential increases in effort and trap proliferation.

Addendum II (2017)

Addendum II establishes a coastwide standard for claw harvest. Specifically, it permits Jonah crab fishermen to detach and harvest claws at sea, with a required minimum claw length (measured along the forearm of the claw) of 2.75" if the volume of claws landed is greater than five gallons. Claw landings less than five gallons do not have to meet the minimum claw length standard. The Addendum also establishes a definition of bycatch in the Jonah crab fishery, whereby the total pounds of Jonah crab caught as bycatch must weigh less than the total amount of the targeted species at all times during a fishing trip. The intent of this definition is to address concerns regarding the expansion of a small-scale fishery under the bycatch limit.

Addendum III (2018)

Addendum III improves the collection of harvester and biological data in the Jonah crab fishery. Specifically, the Addendum improves the spatial resolution of harvester data collection by requiring fishermen to report via 10 minute squares. It also expands the required harvester reporting data elements to collect greater information on gear configurations and effort. In addition, the Addendum established a deadline that within five years, states are required to implement 100% harvester reporting, with the prioritization of electronic harvester reporting development during that time. Finally, the Addendum improves the biological sampling requirements by establishing a baseline of ten sampling trips/year, and encourages states with more than 10% of coastwide landings to conduct additional sampling trips.

Addendum IV (2022)

Addendum IV expands on reporting improvements by establishing electronic tracking requirements for federally-permitted vessels in the American lobster and Jonah crab fisheries. Specifically, electronic tracking devices will be required for vessels with commercial trap gear area permits for Lobster Conservation Management Areas (LCMAs) 1, 2, 3, 4, 5, and Outer Cape Cod to collect high resolution spatial and temporal effort data.

5.0 Fishery Monitoring

The provisions of Addendum III went into effect January 1, 2019. Specifically, Addendum III requires reporting of additional data elements, the implementation of 100% harvester

reporting within five years, and the completion of a minimum of ten sea and/or port sampling trips per year for biological sampling of the lobster/Jonah crab fishery. The Addendum III requirement for commercial harvesters to report their fishing location by 10 minute longitudinal/latitudinal square was implemented in 2021. *De minimis* states are not required to conduct fishery-independent sampling or port/sea sampling.

Overviews of the states' port and sea sampling in 2021 are as follows:

- Maine: Maine conducted 149 sea sampling trips, 23 of which had Jonah crab measurements, for a total of 865 sampled Jonah crabs. Types of information collected included: shell width, sex, discards, egg bearing status, cull status, shell hardness, and whether landings are whole crabs or parts. Maine's lobster port sampling program was suspended in 2011.
- New Hampshire: Staff sampled 66 Jonah crab on 13 sea sampling trips and collected information on sex, the presence of eggs, cull condition, molt stage, and carapace length. NH initiated a quarterly port sampling program in late 2016. Quarterly sampling took place at shellfish dealers, where an interview with the captain occurred and a biological sample was taken. A total of 605 Jonah crab were sampled (sexed, measured for carapace width, and weighed when feasible).
- Massachusetts: Massachusetts made 11 port sampling trips and sampled 4,504 Jonah crab from seven different boats. Data collected include carapace width, sex, egg bearing status, cull status, and shell hardness. No Jonah crab sea sampling trips were conducted.
- Rhode Island: Rhode Island did not conduct sea sampling for Jonah crab in 2021, due to funding and staff limitations. Six port sampling trips were conducted in 2021, measuring 1,308 Jonah crabs caught in two different Statistical Areas. Types of information collected included: carapace width, sex, egg bearing status, cull status, shell hardness, and shell disease condition.
- Connecticut: No sea sampling or port sampling trips were conducted for Jonah crab.
- New York: Staff conducted 13 market sample trips, sampling 665 male and 1 female Jonah crab. No sea sampling trips were conducted for Jonah crab in 2021.
- New Jersey: No sea or port sampling trips were conducted for Jonah crab in 2021.
- Delaware: No sea or port sampling trips were conducted for Jonah crab in 2021.
- Maryland: No sea or port sampling trips were conducted for Jonah crab in 2021.
- Virginia: No sea or port sampling trips were conducted for Jonah crab in 2021.

6.0 Status of Surveys

The FMP for Jonah crab encourages states to expand current lobster surveys (i.e. trawl surveys, ventless trap surveys, settlement surveys) to collection biological information on Jonah crab. The following outlines the fishery-independent surveys conducted by each state.

Maine

A. Settlement Survey

The Maine settlement survey was primarily designed to quantify lobster young-of-year (YOY), but has also collected Jonah crab data from the sites throughout the survey. Jonah crab

information collected includes carapace width, sex (when large enough), ovigerous condition, claw status, shell hardness, and location. The density of YOY Jonah crab increased over the past two decades with high values in 2012 and 2016, then declined slightly in recent years (Figure 1). In 2020, density of YOY Jonah crab increased from 2019 (Figure 1).

B. State Trawl Survey

The ME/NH Inshore Trawl Survey began in 2000 and is conducted biannually (spring and fall) through a random stratified sampling scheme. Jonah crab data has been collected since 2003. The 2021 spring survey ran from May to June and completed 118 out of 120 scheduled tows. A total of 170 Jonah crabs were caught and sampled, with 63 females, 106 males, and 1 unsexed caught and measured. The 2021 fall survey completed 89 out of 120 scheduled tows; a total of 65 Jonah crabs were caught and sampled, with 31 females, 33 males and 1 unsexed caught and measured. Abundance indices for Jonah crab have been declining since 2016 (Figure 2).

C. Ventless Trap Survey

Maine began its Juvenile Lobster Ventless Trap Survey in 2006. Since the beginning of the survey, Jonah crab counts were recorded by the contracted fishermen, but the confidence in early years of this data is low because of the confusion between the two *Cancer* crabs (Jonah crab vs. rock crab) and similar common names. In 2016, the survey began collecting biological data for Jonah crab including carapace width, sex, ovigerous condition, claw status, shell hardness, and location. In 2021 Jonah crab catch in the survey increased in all areas from 2020. Concentrations of Jonah crab were highest in Statistical Area 511 and decrease to the southwest (Figure 3).

New Hampshire

A. Settlement Survey

Since 2009, species information has been collected on Jonah crab in the New Hampshire Fish and Game portion of the American Lobster Settlement Index. Figure 4 depicts the CPUE (#/m²) of Jonah crab for all NH sites combined, from 2009 through 2021. The time series shows a general upward trend with a time series high in 2020 and slight decline in 2021.

B. Ventless Trap Survey

Since 2009, New Hampshire Fish and Game has been conducting the coastwide Random Stratified Ventless Trap Survey in state waters (statistical area 513). A total of six sites were surveyed twice a month from June through September in 2021. Beginning in 2016, all Jonah crabs were evaluated for sex, carapace width (mm), cull condition, and molt stage. A total of 8 Jonah crab over 8 trips were measured during the 2021 sampling season.

Massachusetts

A. Settlement Survey

The Juvenile Lobster Suction Survey has consistently identified *Cancer* crabs to genus level since 1995, and Jonah crab have been consistently identified to species in the survey since 2011. The mean number of Jonah crab observed in the MA DMF Settlement Survey in the GOM region has generally been increasing since the survey consistently began collecting information on Jonah

crab in 2011 (Figure 5).

B. Ventless Trap Survey

The Massachusetts Division of Marine Fisheries (MA DMF) Ventless Trap Survey is conducted in MA territorial waters of NMFS statistical areas 514 and 538. Stratified mean catch per trawl haul (CPUE) for the survey is standardized to a six-pot trawl with three vented and three ventless traps. Bycatch data from the 2021 MA DMF Ventless Trap Survey is still being entered and QA/QC'ed due to limited staffing and is currently unavailable. The 2020 data point was the third highest of the time series (Figure 6).

C. Trawl Survey

The MA DMF Trawl Survey data are divided into two regions, Gulf of Maine (survey regions 4 and 5), and Southern New England (survey regions 1-3). Except for the fall survey in the GOM region, Jonah crabs are infrequently caught in the MA DMF Trawl Survey. Since generally increasing in abundance since the mid-1990's, the last couple of years of the fall survey in the GOM have been closer to the time series median (Figure 7). The 2020 spring and fall MA DMF bottom trawl surveys were canceled due to COVID-19.

Rhode Island

A. Settlement Survey

The RI DEM lobster YOY Settlement Survey (Suction Sampling) intercepts Jonah crabs. In 2021, the Jonah crab index was 0.08 Jonah crabs per quadrat, below the time series mean (Figure 8).

B. Ventless Trap Survey

Since its inception in 2006, the RI Ventless Trap Survey (VTS) has recorded counts of Jonah crab per pot. Carapace width, sex, ovigerous condition, and location data have been collected for all Jonah crabs encountered in the survey since 2015; prior to this, only counts of Jonah crab were recorded. Catch per ventless trap of Jonah crab in 2021, at 1.63, was higher than the time series mean of 1.32 crabs per ventless trap (Figure 9).

B. Trawl Survey

RI DEM has conducted spring and fall trawl surveys since 1979, and a monthly trawl survey since 1990. However, the survey did not begin counting Jonah crab specifically until 2015. Jonah crabs are rarely encountered in this survey, and abundance indices are variable yet low. In 2021, the RIDEM DMF Trawl program conducted a monthly trawl survey within state waters, with 156 total trawls performed. The mean monthly CPUE for Jonah crabs was 0.03 crabs per tow, slightly lower than the time series mean of 0.04 crabs per tow.

Connecticut

A. Trawl Survey

Jonah crab abundance is monitored through the Long Island Sound Trawl Survey (LISTS) during the spring (April, May, June) and fall (September and October) cruises, all within NMFS statistical area 611. The survey documents the number of individuals caught and total weight per haul by survey site in Long Island Sound. The LISTS caught one Jonah crab in the fall 2007

survey and two in the fall 2008 survey. Both observations occurred in October at the same trawl site in eastern Long Island Sound. No trawl survey sampling was conducted in 2020 due to restrictions on field sampling caused by the global COVID-19 pandemic. No Jonah crabs were observed in the 2021 spring or fall surveys.

New York

A. Trawl Survey

New York initiated a stratified random trawl survey in the near shore ocean waters off the south shore of Long Island in 2018 from the Rockaways to Montauk Point and the New York waters of Block Island Sound. Three sampling trips were completed in February, June, and August of 2021. Sixteen to 30 stations were sampled each trip. A total of seven male and one female Jonah crab were caught during the 2021 survey year. The male crabs ranged from 20 to 131 mm, with an average shell width of 59 mm. The female crab measured 37 mm shell width. Date, location, carapace width, and weight are collected for each Jonah crab sampled, and environmental information is recorded for each station sampled on this survey.

New Jersey

A. Trawl Survey

A fishery-independent Ocean Trawl Survey is conducted from Sandy Hook, NJ to Cape May, NJ each year. The survey stratifies sampling in three depth gradients, inshore (18'-30'), mid-shore (30'-60'), and offshore (60'-90'). The mean CPUE, which is calculated as the sum of the mean weight of Jonah crab collected in each sampling area weighted by the stratum area, has remained low throughout the time series, but increased slightly in 2019. A cruise was not conducted in April 2019. Due to the COVID-19 pandemic, 2020 and 2021 CPUE and indices were not obtained (Figure 10).

7.0 Recent and On-Going Research Projects

A. Declawing Study

NH F&G, Wells National Estuarine Research Reserve, and the University of New Hampshire have been conducting a variety of collaborative research on Jonah crabs since 2014. Two of those studies were published in 2021. Goldstein and Carloni (2021) assessed the implications of live claw removal, and Dorrance et al. (2021) conducted follow-up research on that study to better understand the sublethal effects of declawing. These manuscripts provide estimates of mortality for declawed animals, and information on the effects of claw removal on feeding, movement and mating.

In addition to the above-mentioned publications, an acoustic telemetry study was conducted in 2018 and 2019 by same collaborators to assess the movement patterns of both controls and declawed animals. These data are currently the basis for Maureen Madray's thesis (Furey lab-UNH) and will be finalized in the coming months.

B. Growth and Fishery Dependent Data

In 2019, two collaborative studies between the University of Rhode Island and Rhode Island

DEM were published. The first of these was a growth study, which described molt increments for adult females and males and molting seasonality and molt probabilities for adult males in Rhode Island Sound. The second was an interview study in which fifteen in-person interviews were conducted with Jonah crab fishermen to collect their knowledge concerning Jonah crab biology and fishery characteristics. The interviews provided insight into aspects of the species biology and life history that have not been characterized in the literature (e.g., seasonal distribution patterns); identified topics requiring further study (e.g., stock structure and spawning seasonality); and highlighted predominant concerns related to fishery management (e.g., inshore-offshore fleet dynamics).

New Hampshire Fish and Game, Wells National Estuarine Research Reserve and the University of New Hampshire conducted research on growth rates of crabs held at ambient and controlled temperatures for sizes ranging from 5 mm (YOY) to 100 mm. These data are currently being analyzed, and will be available for population assessment purposes.

C. CFRF Research Fleet

The Commercial Fisheries Research Foundation (CFRF) has expanded its lobster commercial research fleet to sample Jonah crab. Biological data collected include carapace width, sex, shell hardness, egg status, and disposition. As of December 2021, 105,894 Jonah crabs have been sampled through the program.

8.0 State Compliance

All states except New York have implemented the provisions of the Jonah Crab FMP and associated addenda. The implementation deadline for the Jonah Crab FMP was June 1, 2016; the implementation deadline for Addendum I was January 1, 2017; the implementation deadline for Addendum II was January 1, 2018; and the implementation deadline for Addendum III was January 1, 2019 (with the exception of the 10 minute square reporting requirement).

- NY is in the process of implementing the full suite of management measures required under the Jonah Crab FMP or Addendum I and II. Specifically, the regulations to limit the directed trap fishery to lobster permit holders only and the 1,000 crab bycatch limit have not yet been implemented. This is because NY crab legislation had to be revised to require a lobster permit for the directed trap fishery and adopt regulations to allow a 1,000 crab daily bycatch to crab permit holders. On June 30th, 2022 the NY Legislature amended NY Environmental Conservation Law § 13-0331 with subdivision 1-a which authorizes NYSDEC to adopt by regulation measures for the management of Jonah Crab. NYSDEC is now in the process of a rulemaking which will limit participation in the Jonah crab directed trap fishery to those vessel and permit holders which already hold a lobster permit, or those who can prove prior participation in the crab fishery before the control date of June 2, 2015. This rulemaking will also establish a bycatch limit for Jonah crab of no more than 1,000 crabs per trip for non-trap gear and non-lobster trap gear.

9.0 De Minimis Requests

The states of Delaware, Maryland, and Virginia, have requested *de minimis* status. According to the Jonah crab FMP, states may qualify for *de minimis* status if, for the preceding three years for which data are available, their average commercial landings (by weight) constitute less than 1% of the average coastwide commercial catch. Delaware, Maryland, and Virginia meet the *de minimis* requirement.

10.0 Research Recommendations

A stock assessment for Jonah crab is scheduled for completion in 2023. Research recommendations will be made by the Stock Assessment Subcommittee and Peer Review Panel.

11.0 Plan Review Team Recommendations

The following are recommendations from the Plan Review Team:

- The PRT recommends the Board approve the *de minimis* requests of DE, MD, and VA.
- The PRT notes that MA has been unable to meet the August 1 deadline for compliance reports for the last several years.
- The PRT recommends that jurisdictions with crab-only fishermen report on the number of these fishermen, their collective number of traps fished, and the rules governing their fishing activity.
- The PRT recommends the LEC review compliance in the Jonah crab fishery, given it is a fairly new fishery management plan and lessons may be learned.

12.0 Tables

Table 1. Landings (in pounds) of Jonah crab by the states of Maine through Virginia. 2010-2020 landings were provided by ACCSP based on state data submissions. 2021 landings were submitted by the states as a part of the compliance reports and should be considered preliminary. *C= confidential data*

	ME	NH	MA	RI	CT	NY	NJ	DE	MD	VA	Total
2010	1,093,962	C	5,689,431	3,720,440	C	968,122	30,441		17,845	C	11,690,787
2011	1,096,592	C	5,379,792	3,213,119	C	69,440	27,025		92,401	C	9,947,142
2012	556,675	C	7,540,510	3,774,300	2,349	410,349	68,606		C	C	12,552,537
2013	379,073	340,751	10,109,590	4,651,796	51,462	371,713	8,143		C	C	16,075,636
2014	348,295	404,703	11,904,611	4,435,934	49,998	83,060	33,156		153,714	C	17,413,503
2015	312,063	C	9,128,876	4,298,894	C	207,424	68,116	C	39,750	C	14,253,327
2016	602,206	150,341	10,660,653	4,224,092	C	165,427	261,287	C	14,656	C	16,084,217
2017	1,042,807	114,155	11,698,342	4,111,281	C	158,231	433,132	C	23,564	C	17,594,666
2018	1,054,489	22,434	13,250,803	4,665,701	C	231,642	880,192	C	60,628	C	20,175,488
2019	763,760	70,818	9,674,107	4,222,305	C	125,391	1,061,194	C	47,829	C	15,968,414
2020	696,309	31,658	8,576,592	3,319,652	C	105,841	975,522	C	35,606	C	13,744,904
2021	2,574,059	123,729	6,492,162	2,143,795	C	149,918	827,340	C	34,327	C	12,345,330

13.0 Figures

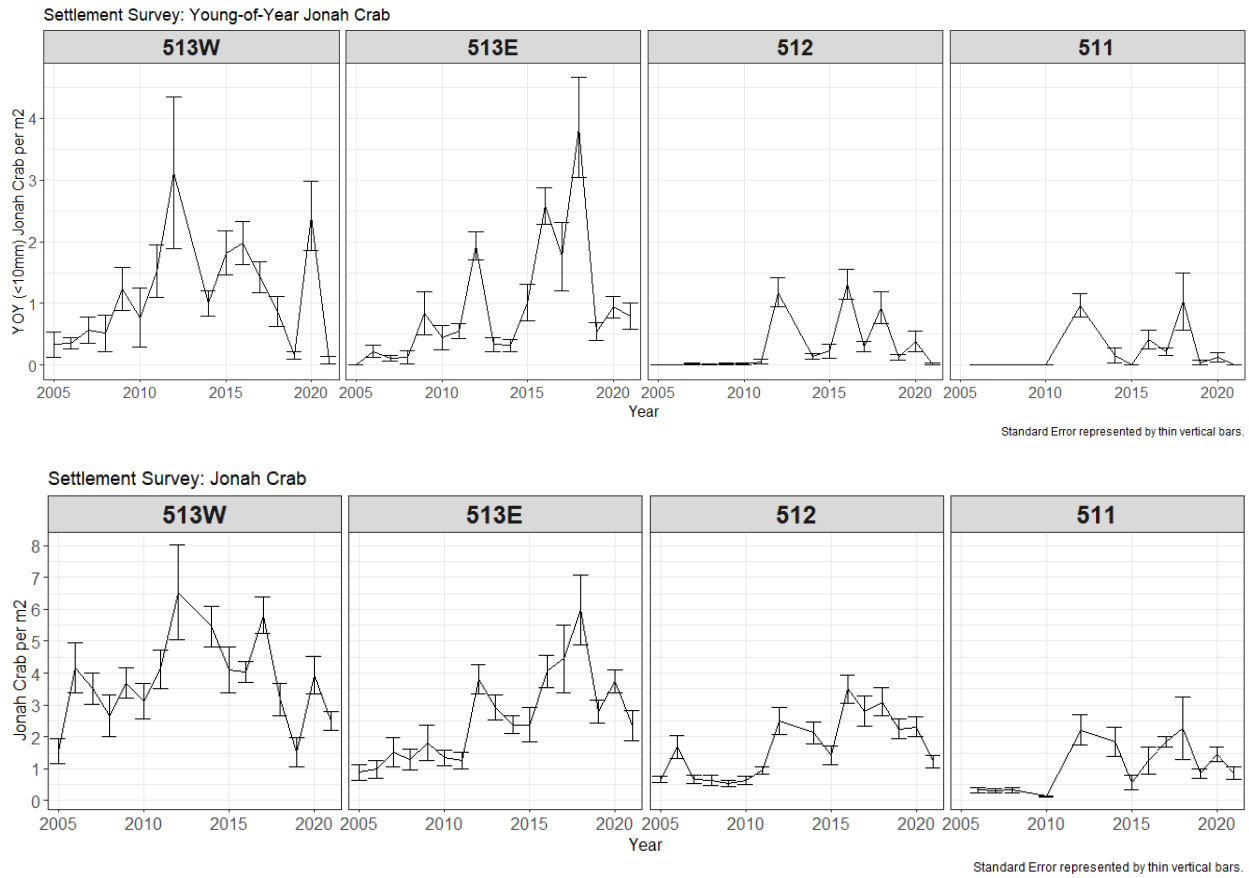


Figure 1. Density of Jonah crab over time in the Maine Settlement Survey by statistical area. The top graph shows the density of YOY Jonah crab (<10mm carapace width) and the bottom graph shows the density of all Jonah crab.

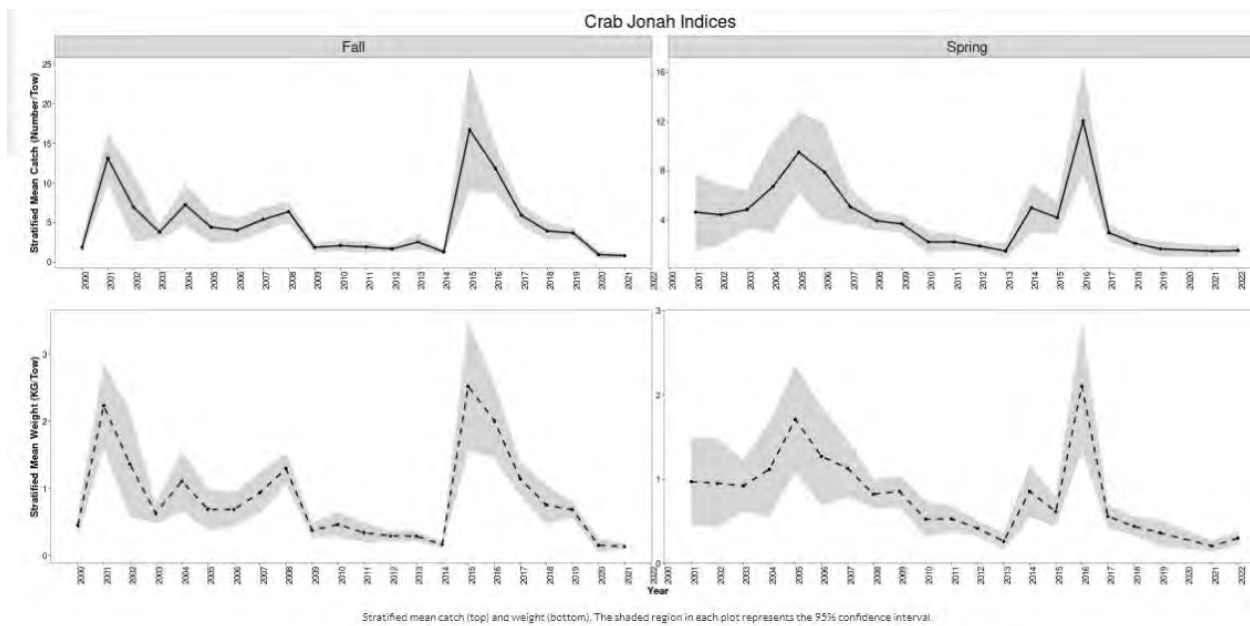


Figure 2. Maine-New Hampshire trawl survey abundance indices for Jonah crab, 2001-2021. Stratified mean catch (top) and results from the stratified mean weight (bottom).

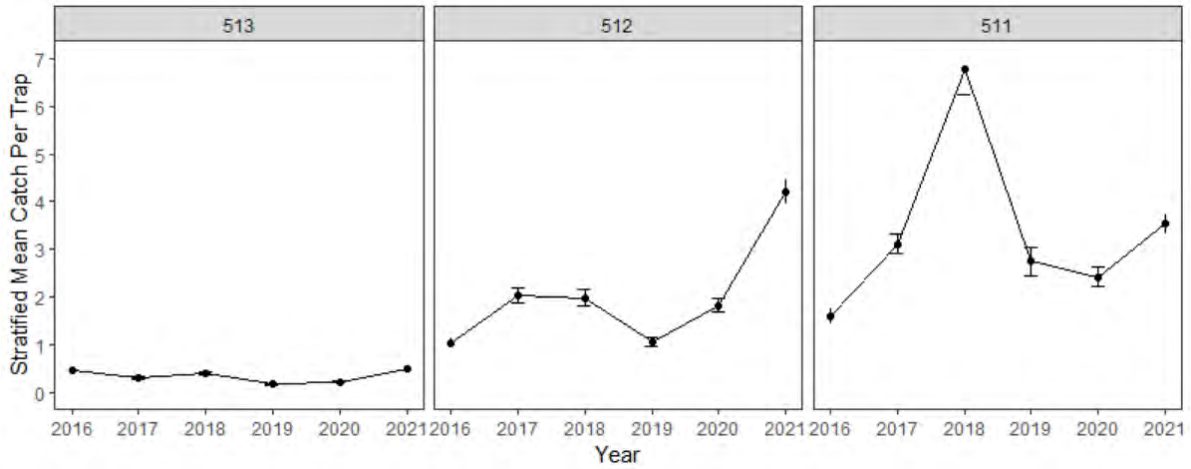


Figure 3. Stratified mean of Jonah crab from Maine Ventless Trap Survey 2016-2021. Standard error shown.

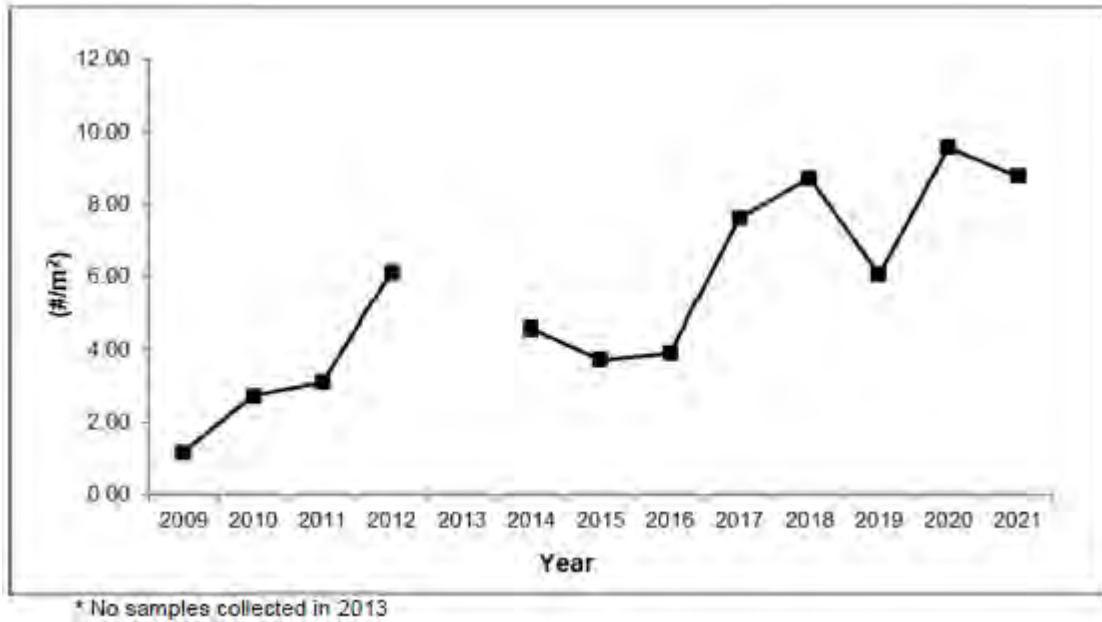


Figure 4. Catch per unit effort ($\#/m^2$) of Jonah crab during the American Lobster Settlement Index Survey, in New Hampshire, from 2009 through 2020.

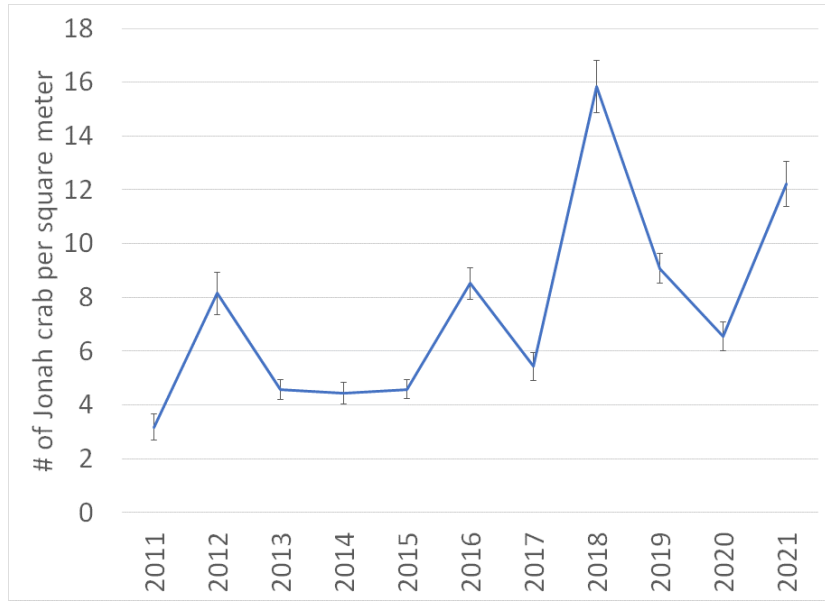


Figure 5. Mean number of Jonah crab per square meter from the MA DMF Settlement Survey from the Gulf of Maine (GOM) region. Error bars are two times the standard error.

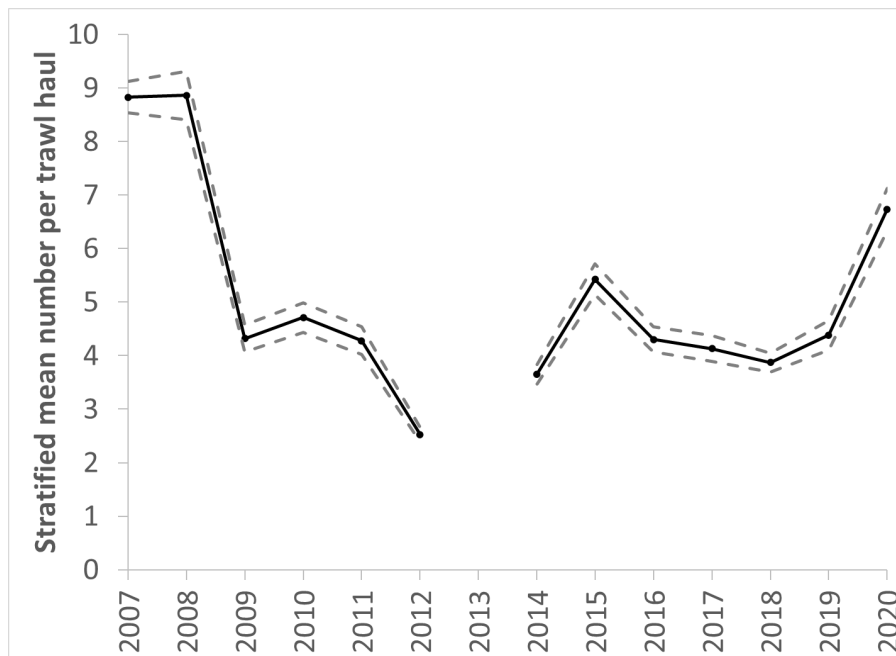


Figure 6. Mean number of Jonah crabs per trawl haul from ventless traps from GOM region of the MA DMF Ventless Trap Survey (standardized to a 6-pot trawl with three vented and three ventless traps). 2021 data are not available yet due to a staffing shortage. Error bars are two times the standard error.

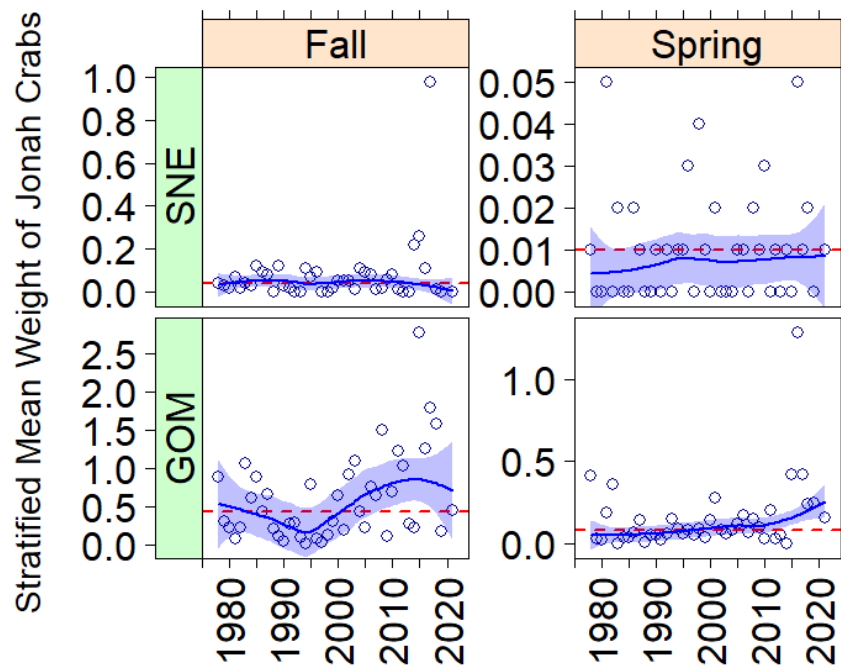


Figure 7. Stratified mean weight (kg) of Jonah crab from the MA DMF Trawl Survey. The left column shows the fall surveys, the right columns show the spring surveys. Southern New England (SNE) is on the top row, Gulf of Maine (GOM) is on the bottom. Red dashed line is the time series median. Blue line is a trend line (Loess smoother), and the blue shaded area is the confidence interval around the trend line. The survey was not conducted in 2020 due to the Covid-19 pandemic.

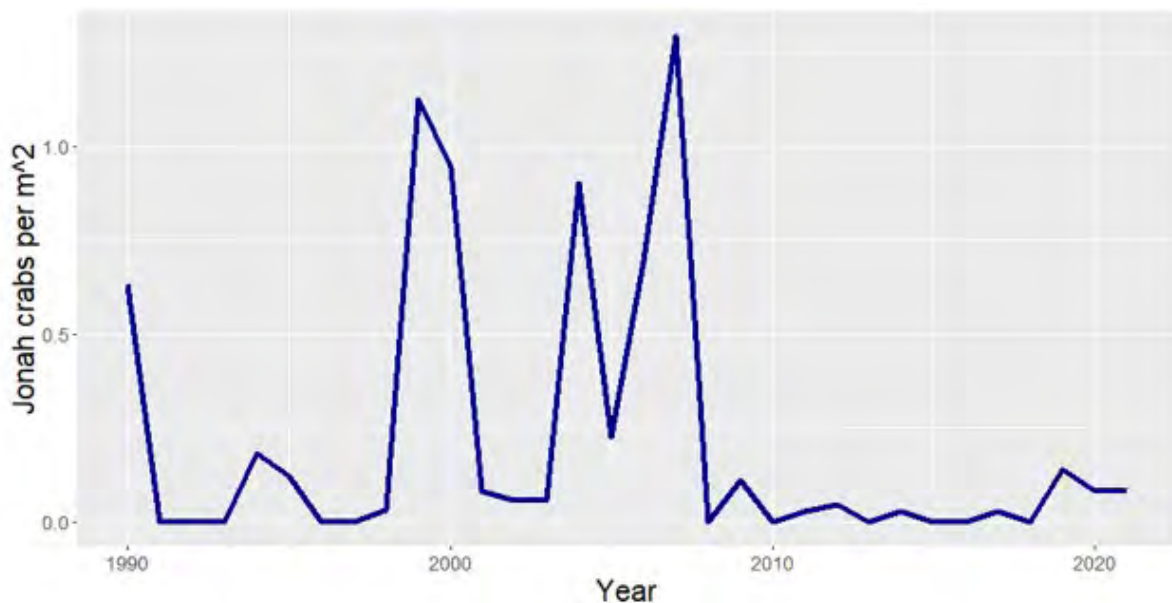


Figure 8. Rhode Island YOY Settlement Survey trend for all Jonah crabs caught per m^2 , 1990-2021.

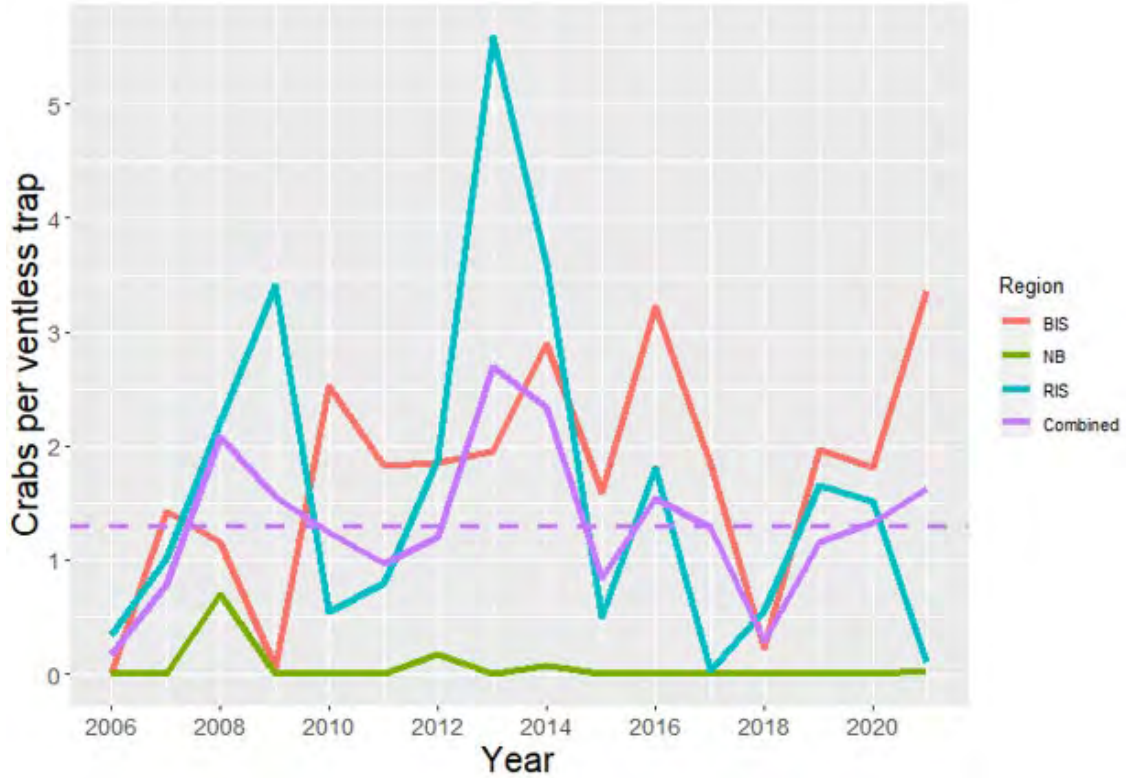


Figure 9. Rhode Island ventless trap survey index of Jonah crab abundance by region: Narragansett Bay (NB), Rhode Island Sound (RIS), and Block Island Sound (BIS). Time series mean for the combined region is presented as a dashed purple line.

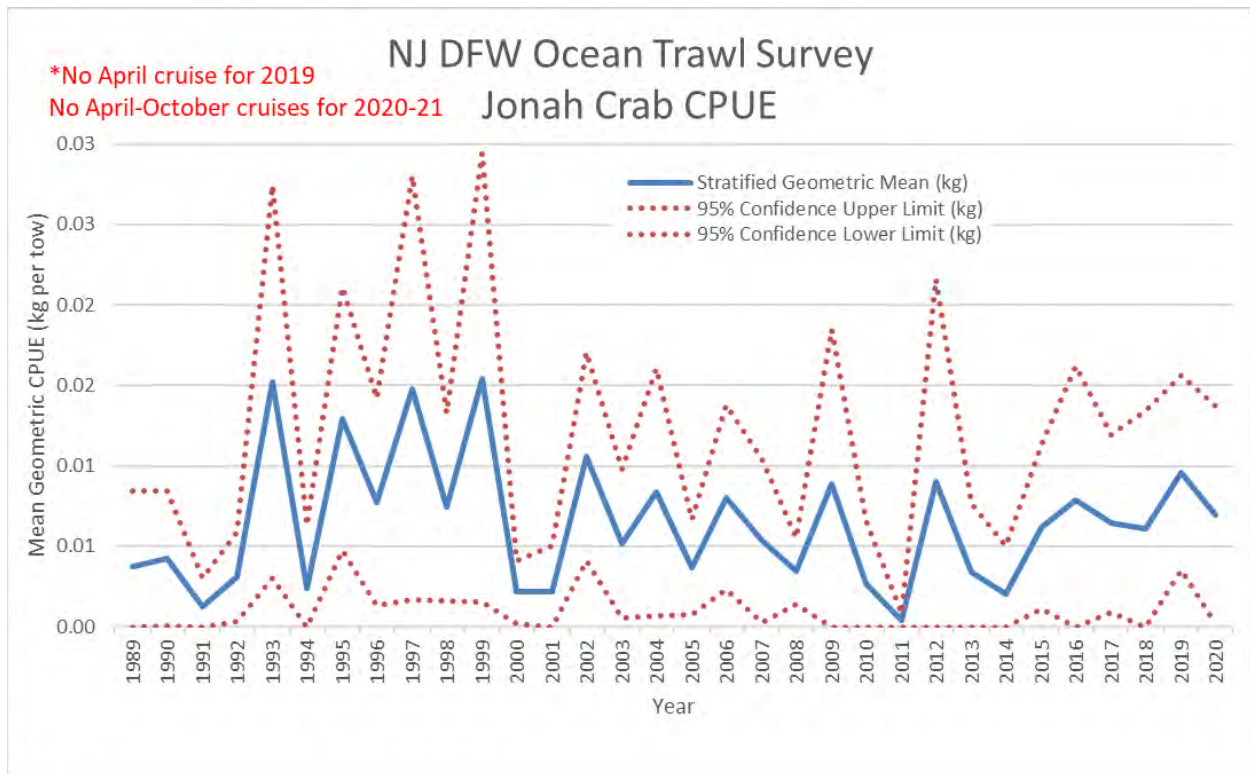


Figure 10. Stratified mean CPUE of all Jonah crab collected aboard the NJDFW Ocean Trawl Survey. The survey stratifies sampling in three depth gradients, inshore (18'-30'), mid-shore (30'-60'), offshore (60'-90'). The mean CPUE was calculated as the sum of the mean weight (in kg) of Jonah crab per size class collected in each sampling area weighted by the stratum area. ***NOTE: No April 2019 Survey was conducted due to Research vessel mechanical issues. Due to the COVID-19 pandemic, 2020 and 2021 CPUE and indices were not obtained.**

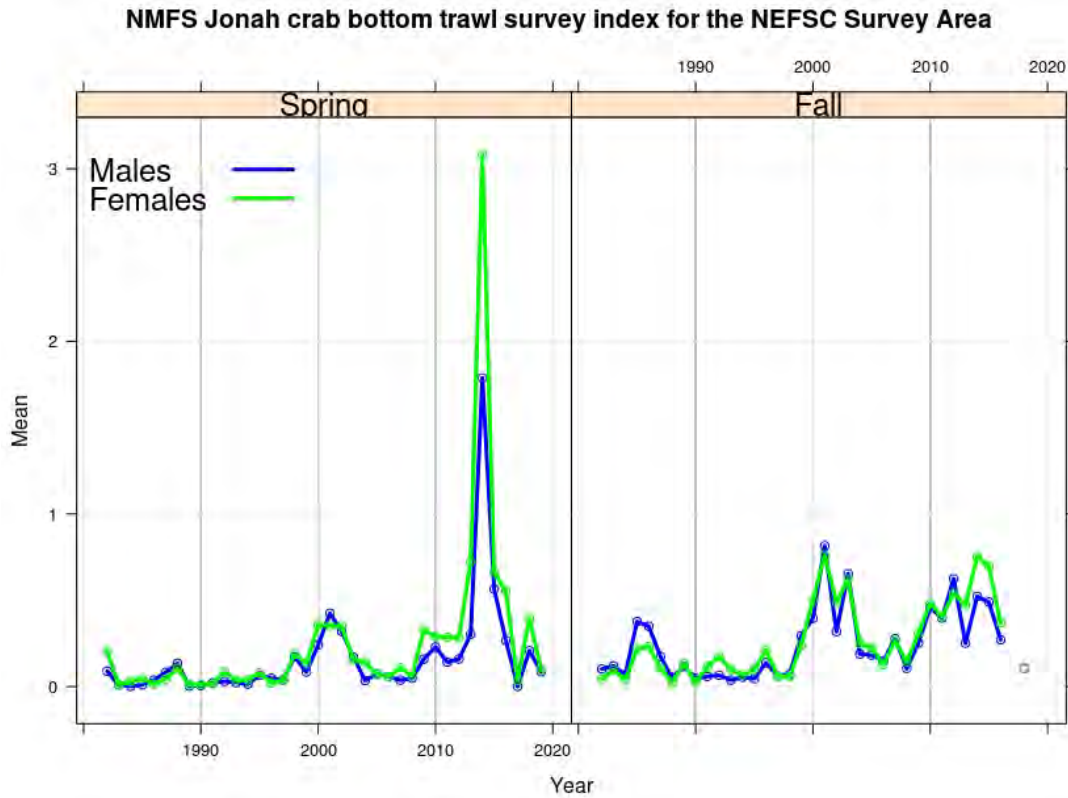


Figure 11. NMFS Jonah Crab index (mean number per tow) from the bottom trawl survey for the NEFSC Survey Area, through spring 2019. There was no survey conducted in 2020 due to the COVID-19 pandemic.

Atlantic States Marine Fisheries Commission

Atlantic Coastal Cooperative Statistics Program Coordinating Council

November 7, 2022

12:45 – 2:45 p.m.

Hybrid Meeting

Draft Agenda

The times listed are approximate; the order in which these items will be taken is subject to change; other items may be added as necessary.

- | | |
|--|------------|
| 1. Welcome/Call to Order (<i>J. Carmichael</i>) | 12:45 p.m. |
| 2. Council Consent | 12:50 p.m. |
| • Approval of Agenda | |
| • Approval of Proceedings from May 2022 | |
| 3. Public Comment | 12:55 p.m. |
| 4. Consider FY2023 ACCSP Project and Administrative Proposals for Funding
(<i>J. Simpson</i>) Action | 1:00 p.m. |
| 5. Consider Atlantic Recreational Implementation Plan (2023-2027)
(<i>G. White</i>) Action | 1:45 p.m. |
| 6. Program and Committee Updates | 2:15 p.m. |
| 7. Election of Vice-Chair Action | 2:30 p.m. |
| 8. Other Business/Adjourn | 2:40 p.m. |

The meeting will be held at The Ocean Place Resort (1 Ocean Boulevard, Long Branch, NJ 07740; 732.571.4000) and via webinar; click [here](#) for details

**DRAFT PROCEEDINGS OF THE
ATLANTIC COASTAL COOPERATIVE STATISTICS PROGRAM
COORDINATING COUNCIL**

**The Westin Crystal City
Arlington, Virginia**

May 2, 2022

These minutes are draft and subject to approval by the
Atlantic Coastal Cooperative Statistics Program Coordinating Council
The Council will review the minutes during its next meeting.

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INDEX OF MOTIONS

1. **Approval of Agenda** by Consent (Page 1).
2. **Approval of Minutes of October 19, 2021** by Consent (Page 1).
3. **Move to approve the FY23 Funding Decision Document and RFP as presented to the ACCSP Coordinating Council** (Page 2). Motion by Lynn Fegley; second by Renee Zobel. Motion carried (Page 2).
4. **Move to charge the accountability workgroup to prioritize and develop an implementation plan based on the recommendations from the accountability report** (Page 8). Motion by Lynn Fegley; second by John Clark. Motion carried (Page 8)
5. **Motion to adjourn** by Consent (Page 22).

These minutes are draft and subject to approval by the
Atlantic Coastal Cooperative Statistics Program Coordinating Council
The Council will review the minutes during its next meeting.

ATTENDANCE

Council Members

Bob Beal, ASMFC	John Clark, DE
Megan Ware, ME, proxy for P. Keliher	Lynn Fegley, MD
Renee Zobel, NH	Lewis Gillingham, VA, proxy for P. Geer
Dan McKiernan, MA	Dee Lupton, NC, proxy for K. Rawls
Jason McNamee, RI	John Carmichael, SAFMC, Chair
Greg Wojcik, CT, proxy for J. Davis	Max Appelman, NMFS
Maureen Davidson, NY, proxy for J. Gilmore	Marty Gary, PRFC
Joe Cimino, NJ	Richard Cody, NOAA
Kris Kuhn, PA, proxy for T. Schaeffer	

Staff

Toni Kerns	Chris Jacobs	Trevor Scheffel
Tina Berger	Ed Martino	Julie Defilippi Simpson
Pat Campfield	Daniel Mestawat	Caitlin Starks
Maya Drzewicki	Sarah Murray	Gabe Thompson
Tracey Bauer	Joe Myers	Geoff White
Alex DiJohnson	Marisa Powell	
Katie Drew	Heather Power	

Guests

Karen Abrams, NOAA	Brett Hoffmeister, ACCI USA	Michael Pierdinock
Pat Augustine, Coram, NY	Jesse Hornstein, NYS DEC	Kathy Rawls, NC DMR
Joey Ballenger, SC DNR	Kathleen Howington, SAFMC	Malcolm Rhodes, SC (GA)
Dave Bard, NOAA	Raymond Kane, MA (GA)	Scott Schaffer, MA DMF
Chris Batsavage, NC DENR	Thomas Lilly	Alexei Sharov, MD DNR
Alan Bianchi, NC DENR	Shanna Madsen, VMRC	David Sikorski, CCA ME
William Brantley, NC DENR	Jerry Mannen, NC (GA)	Rene St. Amand, CT DEEP
Barry Clifford, NOAA	Genine McClair, MD DNR	Jason Surma, Woods Hole Group
Heather Corbett, NJ DEP	Chris McDonough, NYS DEC	Sebastian Tibulle, Woods Hole Group
Nicole Lengyel Costa, RI DEM	David Meservey	Scott Ward
Derek Cox, FL FWC	Thomas Newman	Wes Wolfe, <i>The News-Leader</i>
Lauren Dolinger Few, NMFS	Derek Orner, NOAA	Chris Wright, NOAA
Dawn Franco, GA DNR	Willow Patten, NC DENR	Erik Zlokovitz, MD DNR
Amalia Harrington, Univ ME	Cheri Patterson, NH (AA)	
Carol Hoffman, NYS DEC	Andrew Peterson, BlueFin Data	

These minutes are draft and subject to approval by the
Atlantic Coastal Cooperative Statistics Program Coordinating Council
The Council will review the minutes during its next meeting.

The Atlantic Coastal Cooperative Statistics Program Coordinating Council of the Atlantic States Marine Fisheries Commission convened in the Jefferson Ballroom of the Westin Crystal City Hotel, Arlington, Virginia, via hybrid meeting, in-person and webinar; Monday, May 2, 2022 and was called to order at 10:00 a.m. by Mr. Geoff White.

CALL TO ORDER

MR. GEOFF WHITE: Good morning, everybody. I think we are ready to get started. I am Geoff White, the Director of ACCSP and staffing your meeting today. It is great to have some folks in the room. We're not going to be going through a particular roll call, to kind of just jump into the meeting. But we do have about 12 folks here at the table as members, we have another 5 or 6 who are participating remotely this morning.

Thank you for your attention. Our agenda is focused on the RFP and some status updates, but we should have some time for discussion and direction as we go. Thanks for making the effort to get here. I'm excited to get going, and John Carmichael is our Chair, and he will guide us through.

APPROVAL OF AGENDA

CHAIR JOHN CARMICHAEL: Yes, if I remember how to work the buttons. All right, yes. Thanks everybody, it's good to see you. Good crowd here fairly early on a Monday morning. The first bit of business is Approval of the Agenda, so are there any comments on the agenda? All right, seeing none, agenda is approved.

APPROVAL OF PROCEEDINGS

CHAIR CARMICHAEL: Any comments on the proceedings from October, 2021? All right, seeing none, Geoff, those stand approved. No hands online?

MR. WHITE: No hands online, thank you so much.

PUBLIC COMMENT

CHAIR CARMICHAEL: We'll open it up for public comment. Are there any members of the public that would like to make a comment, please come to the microphone if you're here? I don't see anyone coming forward.

MR. WHITE: No hands.

CHAIR CARMICHAEL: All right, with that then we are off and running. Geoff, I'll turn it over to you to start the presentation.

CONSIDER FUNDING DECISION DOCUMENT AND FY2023 REQUEST FOR PROPOSALS

MR. WHITE: Okay, thank you very much. It is the exciting time of year we get to review the request for proposals for next year. The good news here is there are not a lot of changes to consider, but I will go over these very, very briefly. The COVID step-down exception, to allow extending some projects a little bit longer. That language has been removed. There has been a slight change to clarify that when it comes to the ranking priorities, only one secondary module will be considered in the ranking criteria.

Then in Appendix A of the funding decision document, that is the FDD, was included to show there is one project that is in Year 5, and 0 projects that are in Year 6 of their stepdown, so if you recall in Year's 5 and 6, each of those years there is a 33 percent reduction in the total available funding, based on history.

That way in Year 7 that funding goes away from maintenance projects, and they are making room for new projects to come back in. Then of course, updating all of the relevant dates. All of that is in there. We are prepared for some discussion, but at this point opening up discussion for action on the RFP.

That [RFP approval] would open up the process for partners to generate ideas, submit proposals, and get the Operations Committee and the Advisors to

rank those and bring that back to the Coordinating Council in October for final approval. We took the liberty of drafting a motion, but before we get there, I will ask if there is any discussion in the room, or hands up for those on the webinar.

CHAIR CARMICHAEL: All right, thank you, Geoff. Yes, pretty straightforward. I appreciate you highlighting the few changes for this year. Any comments or discussion from the room? I see no hands. Okay, everybody has been here and done this many times, so I appreciate you helping this go smoothly. Would someone care to make the motion? Lynn.

MS. LYNN FEGLEY: I would move to approve the FY23 Funding Decision Document and RFP as presented to the ACCSP Coordinating Council.

CHAIR CARMICHAEL: Do I have a second? **Renee.** Any discussion on the motion? Any hands online?

MR. WHITE: No hands.

CHAIR CARMICHAEL: All right, any objection to the motion? Seeing none in the room, no hands?

MR. WHITE: No hands.

CHAIR CARMICHAEL: All right, sounds good, motion is approved.

MR. WHITE: Fantastic. I will take a moment and just remind folks that this year as you are thinking up proposals. If your proposal is expected to have an impact on ACCSP staff and workload, to please contact us early in the process to work with you on those details and coordinate the proposal development. Thank you.

COMMITTEE UPDATES

MR. WHITE: In your materials there was a long accountability report in a task that came from the Coordinating Council. Julie Simpson really led that effort as a staff member, and she is online and will be presenting this section. Julie, if you would just say next slide, either Maya or I will get the presentation moving forward.

2022 DATA ACCOUNTABILITY REPORT

MS. JULIE DeFILIPPI SIMPSON: Thanks everybody for your attention to this presentation today. The first thing that I want to do is recognize the Accountability Workgroup. Since the Coordinating Council put forth this charge that group has spent approximately two years working on this, and putting together three surveys analyzing those results, and then putting together the report that you all received. Thank you very much to this group and all of their efforts in doing that work.

As a reminder, the charge from the Coordinating Council was the data validation and accountability issues, and the idea that the data quality and their utility for use can be compromised, when there are validation or accountability issues. The idea was, how are partners validating the data?

Are there potential impacts for data use? Then is the ACCSP receiving data in a timely way, and are there coordination gaps? This charge was sent to the Commercial Technical Committee, and that group put together a small workgroup that evaluated the current validation practices that are in use by the program partners, and was set to review those and determine what are the gaps between the current procedures, and what's needed potentially for better data.

Then the idea was to review the Atlantic Coast Data Standards, and to potentially update those as needed. As you'll see through this presentation, the final directive changed a little bit as the workgroup progressed. The objectives that the small group lined out for themselves, was first to define accountability.

It was quite clear that that word meant a lot of things to a lot of different folks after the first survey, and so it was necessary to start out with a definition of accountability before we moved forward any more. Then to inventory the current practices and procedures, define the gaps between that and the data needed for science and management.

Evaluate the practices and procedures to determine which ones were most useful and productive, and then also to document and develop the best practices. Again, that last step does change as the project moves forward. The definition of accountability that was created by the group for the purpose of this project was data integrity, where fisheries data included some QA/QC procedure, and I believe previously this group has seen a picture where there was a whole series of words.

They included complete, accurate, accessible, trusted and timely, and certainty and limitations of data are acknowledged and defined, and the metadata is documented and available. This is essentially the sentence version of the previous slide that this group has seen that had this whole list of words. This definition was put forward in the subsequent surveys that were done, so that those participants would know what we meant when we said accountability.

The approach that the group took was the group first formed in 2020. Three surveys were conducted. There was the original survey, and that survey was actually conducted just before the group was formally put together. Then the second survey was directed to data managers. The third survey was aimed at data consumers, and I'll go through those surveys in a little more detail on some subsequent slides. Then the third step here is evaluation and presentation. Here we have the evaluation and practices and procedures, but then we also have document findings and recommend next steps.

That is the one step that really sort of changed once we got into it, was where we realized that a prescriptive final step in this wasn't going to be the right answer, or at least the group felt that it wasn't the right answer, and that what we needed to do was do a little bit more work before we were able to improve things, and that meant that there needed to be a little bit more coordination.

What we did was we documented what we found, and we recommended next steps for moving forward in the process, rather than ending with a prescriptive measurement. The remainder of the diagram in the approach is the same as the objectives that were set out in the beginning. The first survey, this was directed toward the partner data contacts, and also the members of the Commercial Technical Group.

This was where we asked respondents if their agency used each of 12 different accountability measures. If yes, to describe how that measure was implemented, and approximately what portion of their data were covered by that. The idea here was to determine sort of a baseline of what practices and procedures were currently in use.

There were 19 respondents to this survey, 4 of those were federal, and 15 of them were state respondents. We were able to establish a fairly solid baseline, but this was also where we realized that that definition of accountability really needed to be standardized in the future surveys. From this survey, we realized that the top three methods that are currently in use on the Atlantic Coast are audits.

That is audits of some form are used by all the respondents. To the knowledge of the group, all state and federal partners on the Atlantic Coast. Even those who did not respond to the survey, we believe that were aware of audits that are used at their agencies. Number 2 was comparison of fishermen reports and dealer reports, and then also the use of negative reports.

One of the things that the Workgroup noted was that the use of the dealer fisherman comparison,

and the negative reports is somewhat inversely correlated. If the availability of dealer and fishermen reports is less timely or complete, in terms of comprehensiveness, then negative reports are usually implemented in that partner, because of the lack of timeliness and comprehensive in the dealer and fishermen reports.

The second survey that we conducted was the Data Manager Survey. This was conducted in September of 2020; 52 data managers were surveyed. This is broken out by both sector and jurisdiction in respondents, that's why it's a table. This was because the commercial, the for-hire and the recreational sectors, as well as the jurisdictions of state, federal, and then we also had a Commission respondent and we wanted to separate that person out as well.

You can see there is sort of a cross-hatch here. The purpose of this was to determine what issues are observed by the folks that are the data managers. They are working with the data on a regular basis. The majority of these respondents have been working with data for quite some time. I believe it was 66 percent had been working with fishery dependent data for over 10 years, so we felt this was a very good representation of the folks that are using data. One of the caveats is that while we did ask early on if you were in the commercial, for-hire or recreational sector. A number of individuals are in more than one sector, and the following questions are not done by sector.

Someone could respond to something, where it's only relevant to one of the many sectors that they prepare data for. The Data Managers Survey conclusion, we put 7 issues, essentially, in front of the data managers. Of those 7, 6 of them, over 50 percent were affecting the data quality, and the 7th was other issues that we hadn't mentioned.

There is a variety of issues that are affecting data quality. They do vary by jurisdiction and

sector. But the impacts to data quality and what is deemed the inadequate communication of such impacts, through either metadata or other methods, particularly when you move outside of a particular jurisdiction to a regional or coastal level.

It is something that is significant and needs to be addressed. A number of recommendations are put forth by the workgroup to improve the communication of those data limitations, and provide opportunities for the jurisdictions and sectors to either expand and/or streamline their processes. Our third survey was done in May of 2021.

This was sent to 300 data consumers. We did get 47 respondents. This is represented by a number of the partner agencies, as you can see in the pie chart on the right. There are also additional classifications in here. At the top you can see that there is one academic, and then on the nine o'clock position, you can also see that there are three other respondents. This includes folks like journalists that use the data.

The purpose here was to determine what are the data issues that are observed by the data consumers. Very similar to the data managers, what do they see in the data as being the problems? The majority of the responses the AWG or the working group found that there are several issues, but the majority of them are linked to communication rather than data issues.

It's not about a particular field not being collected, it's about the idea that the fields that are labeled and the metadata that goes along with that or the ability to know who I'm supposed to ask. That's what's missing in these communications, and so the data are there. The information is available. It's just that that is not being communicated or readily available to the data user, to be able to go back and say, ah this is what this means, or this is who I'm supposed to go to.

The recommendations that the workgroup created for this particular section are primarily geared

toward the increase of communication, in terms of availability of knowing where to go, and making that more readily apparent, and then also increasing the metadata that is available, and the caveats that are presented with data.

The Workgroup came up with 9 recommendations that are in the document. The first is a multi-jurisdictional effort to document the metadata and caveats. Again, this is about creating awareness of what data are being collected, and making that available to those that are using the data. The second is to create a regular and ongoing Best Practices Workshop, so that there can be discussion and sharing of automation and technical advances that are improving data quality, such as the automation of audits.

We would also like to consider our Best Practices Workshop as part of the fisheries information of FIS project, for either fiscal year 2023, at this point it could potentially be 2024, for data providers to compare data collection programs, audit, and trips and dealer reports. Then also, work with ACCSP to develop automated auditing and data validation tools, particularly for the data entry tools, but also for any validations that are conducted by partners.

As many of you know, we do have funding for an FIS project that is geared toward auditing at the ACCSP level that would centralize and standardize some of that auditing, and remove that burden from the partners, so this recommendation is geared toward essentially paralleling that effort, and expanding it if necessary.

Identify and share funding resources for the development and implementation of technical resources. Developing a Frequently Asked Questions document, the idea of this is not that there aren't a number of frequently asked questions available, but the idea is to create one that is centralized among the ACCSP partners, and can be shared by all partners, so

that there is essentially a standardization available among the FAQs, so that the answers to the number of questions are different, depending on where you read your FAQs.

Then also, ACCSP and other data providers should review the data element and field definitions. This way making sure they are comprehensive, and also including any indication of reliability that might be part of that field, and then considering how those definitions can be part of a data download rather than available via another link or source. Expand and simplify the language on the ACCSP website to better describe the federal laws regarding data confidentiality and data sources, and possible effects that may have on a data query.

There was an acknowledgement that while that language exists, in some cases it is separated in multiple different places, and may not be as readily transparent or noticeable by someone who is pulling the data. Then the final recommendation is continuing the communication between the ACCSP and other Atlantic States Marine Fisheries Commission staff, and among the state and federal partners about data timing for stock assessments, management documents and compliance reports.

Again, this recommendation is particularly worded as continue, because there is recognition that this is already happening, and has been a significant improvement in the last three to five years in the way that data are processed and disseminated. The recommendation here is to just continue on that path. That concludes the recommendations, and all the slides that I have, and so Mr. Chair, if you would like to open the floor for any questions.

CHAIR CARMICHAEL: Yes, and thank you, Julie, for that excellent overview presentation, and definitely thanks to the Working Group for getting this done, through COVID, I'll point out, which it's really great to see all this progress continuing to be made, despite what we've dealt with the last couple of years. It looks like a pretty good effort, lots of surveys, lots went into it, and some great recommendations. With that I'll open it up to the

floor for any discussion or questions. Yes, Ms. Fegley.

MS. FEGLEY: I first just want to thank the Workgroup, and I also want to thank all of the people who responded to the surveys. I understand that we threw this out there as a little bit of a generalized idea, understanding that there was an issue here. I think that the Workgroup did just an excellent job of running with it, and turning this into something that is going to be incredibly useful.

I just want to say that there is some discussion in the document about what it takes to create data that is all of the highest quality, and that states don't necessarily always have the time or the resources. But I also want to say that the states don't always have the authority too, to make the changes that they need to make to really make the data what it needs to be.

That is going to be one of the beauties of this, is that the more specific technical guidance the states can receive on what it takes to achieve high quality accountable data, the more leverage states are going to be to make the changes that they need to make, and it also help us understand why that's important. I really want to thank you all, Julie and the Workgroup for what you've done. I also just had, if I may, Mr. Chair, a question. There was some discussion about data fields that have less credibility than others.

One of the examples used in the document was gear code, in particular. I just wonder if I can get a little more information about whether or not the people who are the stock assessment staff understand which field might not be as credible, and also Plan Development Teams for issues like allocation. Because it seems like that is a potentially pretty sticky issue if we thought data fields that we know are not reliable, are we getting that information to the people who really need it? With that I'll stop, thank you.

MS. SIMPSON: Mr. Chair, would you like me to answer that question?

CHAIR CARMICHAEL: Yes, please.

MS. SIMPSON: Yes, the recognition was made that while there are a number of parties that are aware of that. That happens on what might be considered a slightly more ad hoc basis, and so that knowledge isn't necessarily comprehensively aware to everyone that is using the data. That is exactly one of the holes that we feel like we need to close, where when someone pulls a fishing report, yes.

You can rely much more heavily on that gear code. But when you pull a dealer report, that gear code really should be used with the knowledge of the fact that that is information that is being passed, and may in some cases be a supposition rather than actual fact, and that the longer folks work with data the more aware of that they are. But especially for newer folks, or for someone who is not communicating heavily with data providers that may be unaware. I think you've touched on one of the larger issues that the Working Group became aware of.

CHAIR CARMICHAEL: Thank you, Julie. Renee.

MS. RENEE ZOBEL: Yes, I'm going to kind of follow up on Lynn's comment. I appreciate that there was a mention of trying to do a little bit more in the system itself, as far as QA/QC during the data entry process kicking out errors and bounds and that kind of thing, because you know as you mentioned, some of the gear, it's not just the gear code, but a lot of the gear characteristics are a struggle.

Having better definitions in there. I know we used to have heavier definitions on the entry side of things than we do currently, as far as when somebody sees it on the entry end. But I just appreciated that we're looking at different ways to make the data cleaner from the entry end, because as indicated in the report, it can be very difficult to get permission from a harvester, or get them to go in and change their information, or it might need to

be done on a broad scale, which involves usually ACCSP and asking for a global ask.

CHAIR CARMICHAEL: Julie, not to put you on the spot, but any thoughts? Feel free to weigh in.

MS. SIMPSON: Yes, I think that was certainly a recognition from the Workgroup was the idea that it's not, none of these issues are really focused on any particular point in the process. It's really about the global process. It starts from the fishermen all the way to the stock assessment scientists.

The idea that we could put caveats on the field, but that doesn't help if the fisherman isn't understanding or the dealer, depending on the report, isn't understanding the question that is being asked. Really that's why there are nine recommendations, is because we want to address issues at all levels of the process. Thanks for recognizing that.

MR. RICHARD CODY: I did notice that some of the responses were sector specific. For instance, some were for recreational/commercial, and then you had for-hire. In developing the workshop, I know it's already set. Will there be any consideration as to parsing out the priorities in the Work Shop based on sector? It's a little bit of a loaded question.

MS. SIMPSON: We haven't actually talked in too much detail about that as a working group, so I'll answer from a personal perspective is that yes that is what was in my head. I believe I'm responding to Richard, is that there is going to be a need to work with the Recreational Technical Committee and the Commercial Technical Committee as well.

That there are things, if they are particular to a sector that they are handled by the experts in that sector, rather than by a small working group. I think that as we move forward,

addressing different parts of the process or different aspects might be done by different people, depending on how it moves forward. Hopefully that answered your question.

MR. CODY: Yes, thanks, Julie.

CHAIR CARMICHAEL: Yes, Julie, that was Richard Cody. I thought you might be able to tell. Any other questions? Geoff said there are no hands online, anyone else around the table? Lynn, go ahead.

MS. FEGLEY: I'm just trying to figure out if you need guidance on next steps, or what you would like us to do to sort of guide the path of the Workgroup. I think obviously the Work Shop sounds like a great idea, but if there is anything you need, say the word, and we can make a motion if we need one.

CHAIR CARMICHAEL: Yes, I think that's the next bit of business. I was going to ask Julie. Based on the recommendations, if the groups had a thought of what they should do next. I know you mentioned like the Best Practices Workshops, and getting into that. That is something that may involve some financial at the least, you know certainly some time.

Then there was also mention like a 2023 Workshop with FIS. One thing I was wondering is, do you think that would be the first workshop, or would there potentially be an ACCSP Best Practices Workshop before that? If you could give us some insight into what you and the group sort of feel like is next steps, and if there is any guidance you need from us, let us know.

MS. SIMPSON: Yes, the Accountability Workgroup felt that at this point it would probably be, the way we've thought about it would be to have another small workgroup, potentially having a number of the same folks. That would essentially be charged with moving forward on executing some of these recommendations, and that would probably start with prioritizing them.

At the time that we drafted the working report, we did have an FY23 proposal for FIS. Their preproposal deadline has passed, so I'm not sure we would be able to get in a proposal for that. But we could look into that. But I think that a charge from this group, either in the form of a motion or an informal charge.

Whatever is the group's preference, to form another small working group to prioritize and execute the recommendations from this report would be extremely helpful. If any members of the Council have recommendations on any particular recommendation that they feel is a priority, we would certainly incorporate that in any work that was done.

CHAIR CARMICHAEL: I think that would be good. Maybe someone make a motion along the lines of forming a workgroup to prioritize and develop a plan for implementing these recommendations? Does anyone want to make a motion like that? I think Lynn Fegley would make a motion like that.

MS. FEGLEY: Sure, what the heck, but just a clarifying question. This wouldn't be forming a new workgroup to do that would it? It would be the Accountability Workgroup that would go on and do that, is that correct?

CHAIR CARMICHAEL: Would it be a subset, I think, is what Julie was saying, because is that a pretty big group. But please, Julie, jump in.

MS. SIMPSON: I think that we could use the existing group, it's a smaller workgroup, and then if anyone is not capable of dedicating the time to stay with the group, we could simply find an alternate member for that person. I think charging the same group would be an appropriate move.

MS. FEGLEY: All righty then. I would move to charge the Accountability Workgroup to prioritize and develop, what did we say? Whatever you type I'll move. Perfect, yes that.

Move to charge the Accountability Workgroup to prioritize and develop an implementation plan based on the recommendations from the accountability report.

CHAIR CARMICHAEL: Do we have a second? Yes, Mr. Clark, thank you. Okay, seeing no hands online, so are there any objections to the motion? **Seeing none; the motion is approved.** Thank you, Julie, and thanks everyone for the discussion. I think it really is impressive how a pretty small idea, as Lynn said, became all of this, and was handled this thoroughly. Accountability sounds simple, but clearly there is a lot going on there. The group did an outstanding job with this, and look forward to putting these things into practice in the future. Geoff, move on to the next bit of action.

STATUS UPDATE ON 2023-2027 ATLANTIC RECREATIONAL IMPLEMENTATION PLAN

MR. WHITE: The next two items are status updates that may generate a little bit of discussion. But I wanted to start with recognizing that this year we are continuing to develop the Atlantic Recreational Implementation Plan. This is the next five-year plan for 2023 through 2027. These were initiated as a request from MRIP to get regional input, and use the FINS for all of the regional priorities, and what should happen.

MR. WHITE: The process that we followed in 2017 when we did the first one, was to have the Recreational Technical Committee kind of develop and rank these priorities, and with some feedback from the Coordinating Council on major topics. Over the last year I've asked you, as Council members, to come up with some ideas, and those have gone through the process with Rec Tech to include citizen science and in-season monitoring.

Then just recently over the last few months, the Rec Tech Committee again reranked these. They did take out, there were six priorities before. Instead of going all the way up to eight, they kind of ended up with seven and reranked them. Those in order are on the screen. What I do want to note here is that

while this document was requested by MRIP, and the FINS all submit these back to MRIP for national prioritization of where funds come from.

ACCSP has taken a little bit additional approach to that in coordinating what are the data needs, what are the information that might be necessary, as not just direction to MRIP, but for assessment and management groups in general. I say that because there might be areas here that aren't specific asks of MRIP, but they might be areas where ACCSP as either developing data standards, data consolidation, or data distribution, may be able to help out.

That is where there is kind of an additional perspective that we've added into this. The intent is to continue to flesh out the information that goes underneath of these in the second half of the document, and bring the document back to you in October. What I will say is, Priorities 1 and 2 were there, so that is improving PSE, and the for-hire data collection monitoring. Over the last five years there has been a lot of effort there, and the direction we heard from MRIP was, since those aren't fully realized and completed, to leave them here as continuing priorities for the next five years. Of course, the improved precision and presentation, there has been a ton of progress on. The Modern Fish Act ended up with \$900,000.00 that came to the Atlantic Coast for additional sampling through MRIP, to address the idea of improved precision.

That all went towards, and there is a slide later in the presentation, adding dockside sampling in the APAIS, the Access Point Angler Intercept Survey from Maine through Georgia, as administered through ACCSP. Another thing that happened is the MRIP Survey and Data Standards Group has worked on changing the presentation of the data that is drafted on their website right now, and will become effective, I believe April in 2023, where providing

cumulative information instead of wave-based information.

At least on the public phasing websites, not including where the PSE is greater than 50. That improves data quality and it improves more samples throughout the year to get a more precise and intended accurate information. The other priority here, Priority 2 is a Comprehensive For-Hire Data Collection and Monitoring.

That was the intent to use logbooks more fully, and over the past five years, of course, there are now more federal logbook programs in existence, and those things are moving forward as well. With that summary of where things have happened, there was some work on a workshop for discard and release data that is a recognized data need.

There are currently no perfect solutions identified to try and test and put in place, so that remains a priority for coming up with ideas and pilot testing those. Then of course Items 4 through 7 remain as items of interest, and with that I will pause in the presentation of what these are. You had the document to read and look at, and I will invite comments.

CHAIR CARMICHAEL: All right, thank you, Geoff, for that overview, and I think we should look at the priorities, see if there is discussion on this. You know I think they're kind of in my mind of differing levels and intensities. You know overall we do want improved precision. But I think when you talk about, you know, Number 3, improve recreational discard and release data, that is kind of toward getting you Number 1 improved precision.

I think of when you talk about timeliness, it's kind of hard to do that without considering in-season monitoring, which is down there at Number 7. You know I think of something like citizen science as being potentially throughout this as a way of getting to some of these other things that are priorities to accomplish.

You know there are probably others around here that have some thoughts. I think there might be. Want to just hear what the group says, and how we might want to approach these priorities, and if we want to have some process here to get more of a Coordinating Council voice in that. Dee, I see you raised your hand.

MS. DEE LUPTON: You were talking about some of my concerns too. Is there a way to send this out and have the Coordinating Council rank it ourselves, from more of a management standpoint? I have no issue with what's here, it's just in the priority order and what managers are facing more imminent problems that we need some solutions to, and would like to see them higher prioritized.

MR. WHITE: Thank you, Dee. Yes, that is actually easy for us to do. As we kind of evolve into this process, the Gulf States Commission actually uses their FIN Coordinating Committee as the analogue to this body, to do those priorities. We had kind of worked up with other tasks through Rec Tech in the past.

It is ripe for us. Staff or I will send around these spreadsheets for Coordinating Council members to re-rank these, and then we'll come up with the averages, and put them back in front of you. If we can do that, we certainly have time between now and October to do so. I would also invite you, if you think some priorities could potentially be combined, to let me know soon, before we send that out.

I will say that when it came to citizen science there was a Rec Tech discussion of whether that would fold into discard or one of the other priorities. They had decided at the time that the use of citizen science might be one way to address discards, or one way to address some of the biological information. But in their discussion, it warranted itself as its own bullet priority. But yes, we could certainly invite and bring this back up to a Coordinating Council process to rank them.

CHAIR CARMICHAEL: Lynn.

MS. FEGLEY: It looks like there are some technical issues on the other side there. Yes, I agree with Dee and also John. I think you articulated a lot of our concerns. I know we had submitted a rejiggered priority list back to Rec Tech. In our minds that Recreational fishery discard and release data is hyper critical. I mean, clearly, it's a striped bass thing, but it's going to be an everything thing here before we know it. Also, the improved in-season monitoring. We in Maryland would certainly welcome a more robust discussion and some input of these priorities.

CHAIR CARMICHAEL: I think that would be good. You know these things are very interrelated, and it would be good to try and capture that through the group. Go ahead, Dan.

MR. DANIEL McKIERNAN: My question has to do with improving precision, PSEs and presentation of MRIP estimates. I, and I think a lot of us as state managers, kind of have to listen to the public talking about PSEs. I'm not sure they always know what that means. I'm wondering if part of the improved presentation of MRIP estimates might actually be confidence intervals around an estimate.

Instead of just throwing out a PSE value, because I know we deal with, I mean a lot of times in the management scheme people talk about a cut-off of anything with a PSE above a certain threshold should not be used, et cetera, blah, blah, blah. But I just wonder if we wouldn't all be better served with confidence intervals, and if anybody has ever thought about that, because we deal with a lot of lay people who are not necessarily trained in statistics. I think that might be part of the disconnect we suffer with the public about the precision or lack thereof of some of these estimates, especially when you get down to the mode and the wave level.

MR. CODY: Is it okay if I address this? Yes, there are options to present confidence intervals for some of the graphs that we have on the website.

Certainly, we could provide additional information to help people with their understanding of the data. Generally, though, for PSEs, there are some descriptions there that are available for folks if they want to dig a little bit deeper into what a PSE actually is, they can do so. If you have some specific recommendations related to, maybe the graphic presentation of the data, we would be happy to look at those.

CHAIR CARMICHAEL: Yes, thanks. I know a lot of times when people get in using the data when they take it from MRIP, will often present that kind of stuff. But yes, it certainly fairly straightforward to calculate them from PSEs. It's a matter of doing it. That could be a good part of the discussion. Geoff, I had a question on the timing. This is the final document October, 2022. Is your thought of going out and ranking this that we would have the results of that and we would finalize that in October at that meeting, or would we need to do that prior to October?

MR. WHITE: I think we can get it done over e-mail over the next two to three months. Allow us as staff to fill in some of the text details underneath these bullets, and then bring the document back to you for final approval in October. If there is a desire for more discussion, we can find a way to do that remotely.

CHAIR CARMICHAEL: Okay, does that sound good to folks? We'll handle it individually, get the opinions out there through a ranking exercise, and then this group will finalize how we want to have them presented in the final document at the October meeting. I feel like we're on like maiden. Richard, did you have your hand up again?

MR. CODY: Yes. I just want to, and Geoff, we've had this discussion earlier about the priority of increased utility of citizen science. I look at citizen science as a tool, and not a data

priority. I think it needs to be associated with some of these priorities, I think which John kind of alluded to earlier, for it to be given consideration.

MR. WHITE: Citizen science (microphone issues). Tina, thanks, and thanks everyone for your patience online. We had a little technical swap out with one of the microphones. But we seem to be back on at the moment. Thank you, Richard, for your points on citizen science. My intent and thoughts of including citizen science at the moment were really about identifying some of the data needs that might be there, the text that would go underneath that.

Some of that again, may be more about standardizing data collection, the fields necessary, the data storage and the dissemination, as well as, you know maybe those things fold in as supplemental to MRIP in the assessment management process, not exactly a data need, as a request to MRIP. I will pause there, because I see a hand up from Kathy Knowlton. Mr. Chair, shall we call on Kathy?

CHAIR CARMICHAEL: Yes, please do. It will be nice to hear from her.

MS. KATHY KNOWLTON: Hi, good morning. I would like to go back quite a few minutes to when Dee first brought up the point about the potential for these priorities to be commented on by Coordinating Council. I agree with that. I have some concerns, and would like to discuss whether rankings provided by Coordinating Council members are averaged with those from the Rec Tech Committee.

The reason that I am having this question is because I don't know, but for the Recreational Implementation Plan we have ever done that. Again, just because we haven't done it that way in the past, doesn't necessarily mean we should not make a change for the future. But I feel like the items that are on the implementation plan came through a long and lengthy discussion through the Recreational Technical Committee with details, and

some of that is already articulated in the meeting materials that we have.

I have no objection to Coordinating Council members having comments and additional comment on their perspective from the management point of view with the priorities. But my understanding is these priorities are also used for Operations and Advisors when they rank proposals that are coming in for the next five fiscal years, if projects identify recreational activities.

I sort of feel like that might be somewhat if we got the Biological and Bycatch priorities that stand for two years at a time, and we use the Committees for their expertise in the level of discussion that occurs during the Committees. Although I understand the pressure that comes through the management process for recreational priorities.

I think I would rather see if Coordinating Council members want to comment on it, that they provide additional commentary, and perhaps we take a step back from averaging the rankings. I would really appreciate it if there was additional comment, see what Dee's response to that is, and anybody else that kind of was chiming in on this a few minutes ago. Thank you so much.

MS. LUPTON: I appreciate those comments, and I think some of the comments around the table hit on, I think citizen science as a ranked item, is what I was having some issues with. I would like to see in-season monitoring elevated, but it's still on the list. But citizen science can be a component to all the items, so if we could clarify that. I think that is what I was struggling with when I saw the ranked priorities from a manager's point of view of fisheries management.

How was that something to be implemented? But I can see it component to all of it. We're getting a lot of pressure to do something about

in-season monitoring, to be quite frank. I would just like to see that as a priority a little higher on the Atlantic Coast to help resolve that issue. I don't know how the ranking would come out.

I don't know how, even if we go around the room or through the Coordinating Council re-rank these, how it would be prioritized. I think that is where I was having a little trouble. If he could add the citizen science as a little bit of component of it all and not a ranked item. That is just kind of my comment trying to fix this.

CHAIR CARMICHAEL: Thank you, Dee, and I see, Lynn, you had your hand up.

MS. FEGLEY: Particularly, I would just like to see this discussed, and the input from the states. You know as I understand it, we submitted our thoughts and prioritization, our Rec Tech representative. We submitted this back to the Committee, but Rec Tech hasn't convened to discuss those submissions.

I personally have no problem if the Rec Tech Committee is the one that gets back together, as long as there is the opportunity to have a robust discussion around the state's thoughts on this. If the process is that the Rec Tech reconvenes and discusses the input from the jurisdictions, and then that comes back to us. That is fine. But I just think we need to have that point in the process on there.

MR. WHITE: I'm going to go back to Kathy. Your point of the use of these priorities. We as staff have tried to be efficient in the use of this effort. MRIP asked for an Atlantic recreational regional priority list, and then that list was also used in the Funding Decision Document, which is used in the RFP.

It's also used to kind of direct some other funding activities, not just through MRIP. We've tried to be a little bit efficient in doing so, and of course that may have confused the how we use this particular document, you know the effort to bring it forward are similar in my mind. I also wasn't clear about how to average the input.

I know Kathy was very involved with the Operations Committee, and many of you have been, with the proposal rankings and how to average between Operations and Advisors, and present that back to the Coordinating Council. If it sounded like I had intended that the Coordinating Council priorities would be averaged with the Rec Tech priorities, I'm open to that.

I didn't actually have that set as a process. But I do appreciate the discussion of how this would be used and how to update the priorities with the perspective of the managers. Again, overall process asked that folks within agencies, we could have a lot of these discussions at the different committee levels, but the more conversations that occur within the states as these things happen, as priorities get ranked, is certainly appreciated from our level as well.

CHAIR CARMICHAEL: We sort of have two ideas. One is potentially looping back in Rec Tech. Geoff, is that an option. Then I think the other question is, you know, who really should have the final word on these are the priorities for the implementation plan? Should it be this group, or should it be like however Rec Tech works it out? I guess, Geoff, first question is, is a Rec Tech look at this perhaps after Coordinating Council provides some input a possibility?

MR. WHITE: Yes, they've been having virtual meetings every couple of months. Their next one is, I'm going to forget the date at the moment, but it's probably a month away. There is opportunity to do that, and in terms of overall process, I did raise the approach that the Gulf Commission takes.

Where their FIN Committee, analogous to this group, is the group that actually develops and sets the priorities. There certainly is an opportunity in front of you to kind of change how we have done this in the past. The one that's in place today is the first one that was

ever developed. The one in front of you is going to be our second opportunity to update this and put it forward. Again, it's not like it's a longstanding tradition and we have to do it the way we did it before. Pleasure of the group to say, where do you want those priorities to be generated from?

CHAIR CARMICHAEL: Then I guess the question for the group that I see is, do you go with Rec Tech and their priorities, and approve that or does this group feel like it should have the final word in the priority list? Are there any thoughts on that?

MS. LUPTON: Well, I reckon I look at, I don't mind sending it back to Rec Tech and have them reevaluate after the Coordinating Council talks to Rec Tech members. You know if you go that way, I certainly will do that. But the Coordinating Council has always, if it's brought to us for final decisions, it seems like we should have an influence in that final decision.

I can go either way, but what is the purpose of bringing it back for final decision in October, if we really can't influence it or change it? If it's just voting on Rec Tech's recommendations all the time. I just think that is more of a philosophical type question. But I can go either way. If we go back to Rec Tech, I would like an opportunity to talk to the Rec Tech member a little bit more from a management standpoint.

You know what the needs are, and then actually ask them to re-rank them, something like that. It is what it is. I don't have any, from my perspective, anything to add to the priorities, maybe as I said before, make citizen science a component one, and actually withdraw it as a priority. Then they are all listed there. There may be some influence to re-rank them, but it may stay the same. I don't know if that helps any.

CHAIR CARMICHAEL: Yes, I think it does. You know I think Kathy made a good point about there are various types of prioritizations that go on throughout this whole ACCSP process. I certainly wouldn't want the Coordinating Council to have to

start approving annual sampling targets, that sort of thing.

But this being like a five-year plan, these to me are a little bit higher level types of priorities, so it may be more appropriate for the Coordinating Council to get into that. Then I think with seven priorities is a lot. I think we're all pragmatic enough to realize that it's unlikely that all of these things are going to be achieved.

As we initially discussed, some of them are kind of things that have been goals and objectives of the program for 20 years, and we're still working for them. I think the report has some of this, but some more detail and more tangible steps would probably be helpful in the final document about, okay what can really be done to improve the precision, which is a critical issue. What can really be done to improve recreational fishery discard and release data?

That may be where some of these global things like citizen science could be highlighted, without just being a generic priority to use citizen science. That doesn't mean a whole lot, and probably won't affect any change, if it's not directed towards some particular, specific data need. Citizen science is not going to be likely the place where you're going to improve precision of the estimates, because it's really not practical for that. But it may help with some other issues about data. Kathy, I think you had your hand up too, so let's go to you next.

MS. KNOWLTON: Yes, okay. Appreciate all this conversation, and I've been texting Georgia's Rec Tech member, she's listening on this call. She is letting me know that it was already her understanding that the Rec Tech would in fact review what comes out of other committees review of this, and in particular of course, the Coordinating Council.

I think we're closing in on a good activity and in a good way moving forward is that if staff want

to circulate e-mails to Coordinating Council members, so that they can add to the comment that has already taken place during this portion of the meeting, or ask a couple of questions, or provide some input to the group.

Then the Rec Tech is already planning to have a point at which they can review those comments, and then bring it back. What I hope is that through that process that we'll be able to get the best of what the Coordinating Council members right now are talking about, with some of their priorities through management.

Also, the umbrella of citizen science, and then provide those comments to the Recreational Technical Committee for presentation back to us in October, and then of course at that time, as is traditional with any other committee output, we would have final comments from the Coordinating Council. I like that path moving forward, and I appreciate you all's time today.

CHAIR CARMICHAEL: Yes, so, Geoff, I think if I could summarize where we are, staff will solicit comments, suggestions, et cetera from the Coordinating Council on the priorities. That will go to the Rec Tech, they will talk about it, discuss it, and we'll have a final priority list for October.

MR. WHITE: Sounds good, we'll take care of it.

CHIAR CARMICHAEL: We can move on.

STATUS UPDATE ON METHODOLOGY FOR LOGBOOK ESTIMATES OF CATCH AND EFFORT WITH DOCKSIDE VALIDATION

MR. WHITE: Before we do that, there were no more hands online. All right, one of the other items that I wanted to give you the status update on. There was a document in materials on the Comprehensive For-Hire Data Collection Program. This is the methodology to more fully utilize logbooks with dockside validation for both effort and/or catch.

It includes the effort survey with dockside survey for catch. The document as written is a proposed methodology for logbook estimates. We recognize the situation of today that on the Atlantic there is no logbook program that exactly meets everything that is in this document. This is a future goal.

It is recognizing that there is the Gulf of Mexico SEFHIER Program that has some of these components, and others. The intent is to really find a methodology and work it through the MRIP certification process as a design, to work forward and balance the statistical rigor for an additional approach to use logbooks more fully. The coastal consistency of having one or two methodologies, so kind of the idea of using logbooks, as well as the idea of using the For-Hire Survey design that has been in place, I believe since 2005. Two vessels that may be in neighboring slips, but fall under different regulatory data submission or surveys, would be able to have that information combined for a total state for-hire catch estimates.

That is the ultimate goal. It does at the moment include no fishing reports, electronic logbook reporting, the use of APAIS as a dockside catch validation, and then the estimation on math that was primarily based on a pilot that we did, in coordination with South Carolina in 2016. Again, it assumes that the For-Hire Survey will continue, assumes kind of splitting some of those vessel frames.

There was a bit of a discussion, or at least a preamble to the document on how to frame this. At this point I'm going to go one more slide forward and come back to the idea of requesting comments. But our next step is to submit this to MRIP for review. Maya, thanks for going to that slide.

First thank you to NOAA for the use of their slide. But this is the whole certification process, which the box in red, I added the red. It is basically requesting the survey component for

peer review. We're not even to that step yet. This idea of certification is an iterative process.

It's, take an idea, take a design, present it to MRIP, get some feedback as an iterative of what are concerns from the statisticians, and the design perspectives. Then kind of go back and forth on that development and MRIP consultation, and actually submitting those materials for peer review. We're kind of at the early stages here.

The idea is to be able to more fully utilize logbooks. At the moment there is only, most federal vessels do have a logbook component, but not all of those are integrated into use by MRIP as of this date. There are state programs that again, have been in existence for a long time and doing a great job.

But there might be areas of the timing of that submission, or some other aspect that isn't at the same level of where Rec Tech has been discussing, and the ideas of observational independence. If there are three data streams, the idea of a hail-out is independent of a logbook, which is independent of a dockside sample.

If those three things can happen as separate events and then be combined later on in the estimation process, I think that is one of the major places that when we hear MRIP talk about observational independence and designing surveys in the Gulf of Mexico, as well as the Atlantic. Those are things that come to my mind.

While I am here, I will certainly call out that this process isn't new. The Gulf of Mexico has many state or alternate surveys that have been through this process. The design of the dockside component, APAIS, has gone through this process, and the design of the Fishing Effort Survey has gone through this process. It's kind of the Atlantic's turn to ripen up and join the process. At that point I'm going to stop my presentation, and ask if you have comments on the document or the process at this point, or if you would like to submit those over e-mail after this meeting.

CHAIR CARMICHAEL: Mr. Clark.

MR. JOHN CLARK: Thank you, Mr. Chair, while these are working, I'll talk fast. Geoff, do you have a timeline? You know we've been talking about it for years, reducing the duplication of reporting for for-hire, and in a state that has a pretty weak ability to force better reporting, this complaint comes up all the time that you know we call in and you're asking for this, you're asking for that. Any idea of how much longer it will be before a for-hire boat just reports once rather than several times?

MR. WHITE: A couple things to unpack there. No, I can't give a timeline. That is the shortest and easiest answer. But I will say that there have been strides already for those with a Mid-Atlantic or GARFO permit to use those logbooks in place of the telephone call for the For-Hire Effort Survey.

That piece, there has actually been progress over the last couple years to make that easier on the states who are making those phone calls, as well as the vessels who are answering those phone calls, the vessel representatives, I should say. The Word duplicate reporting, and sort of indulge me for the extra moment here.

There are multiple reports that have different purposes at this point in time. The logbooks are designed for one reason. MRIP Surveys have been around longer and have sometimes a different timeline associated with them of when the estimates are required to come out through MRIP. Is there a goal to reduce the overall reporting burden? Yes.

Be that on both the fishing entities as well as the agencies collecting the data. The goal to maximize the use of the data and minimize the burden is absolutely there. The timeline for working through this process and addressing the concerns of all the parties involved is a little hard to put a number on. I do not see any hands online.

CHAIR CARMICHAEL: I'm a little concerned about the clock, because it is 11:20, and we're about halfway through the presentation. We may want to just keep moving ahead and maybe skip pretty quickly through some of the other updates.

PROGRAM UPDATES

MR. WHITE: Thank you, Mr. Chair, I can do that. Moving forward to the Program Updates. There is a bunch of items here, but we can move through these somewhat quickly. The first item is the Atlantic Coast Data Standards. On our action plan for this year, we do have the item to improve accessibility of the data standards to be more responsive to partner needs.

We've been as staff working to update those three committees to have more of a text update for static sections, and transition to dynamic sections that reference the current website. Broadly that means for things like the area codes, the gear codes. Instead of printing that in a document that is out of date by the time we actually finalize it. Referencing the data warehouse and the codes of how those items are structured and defined, so that maintains an always accurate reference list, is really where that goes. We've already worked through several of the committees, and we do expect to complete that late in 2022. The item for discussion here is a question, if you would like to handle it today, of the data standards, this is probably the second or third iteration since ACCSP was created.

There is a lot of work at the committee level. The Operations and Advisors do have a plan to review this in September. The question to the Coordinating Council is, would you like to remain as the approving body for those standards, or leave that task to the Operations and Advisors Committee, because it is a detail of the program?

CHAIR CARMICHAEL: Yes, thank you, Geoff, we talked about this some in the leadership pre-discussion of the meeting. The ideas that the Ops Committee and others are much more involved in

the day to day at dealing with the data, and much closer to it than members of this group often are.

Making a suggestion to allow data standard approval to be handled through Ops, rather than a formal action of this group. See if there is any discussion, or if there is support for that today then we can just make that decision and go with it, or if there is a need to discuss it, we could bring it up again in October, and have a more involved discussion of it. Yes, Lynn.

MS. FEGLEY: Yes, I support that. I think the Ops folks are really the most savvy. I would just encourage all of the managers, you know it's a busy day today, and sometimes the nuts and bolts of data are the last on our radar. But certainly, I would encourage Coordinating Council members to make sure they are communicating with their Ops team folks. That communication vine really helps. But other than that, I support that method.

CHAIR CARMICHAEL: Ooh now, Mr. Beal over there.

EXECUTIVE DIRECTOR ROBERT E. BEAL: Yes, you didn't know I was here? Thanks, Mr. Chair. I was going to say the same thing Lynn did. You know the folks that are really down in the weeds on this are the Ops Committee folks rather than this group. They know what needs to be worked on and what works and what doesn't work. I think delegating those decisions to the Ops Committee makes complete sense, to me anyway.

CHAIR CARMICHAEL: Geoff, anything online?

MR. WHITE: No hands online.

CHAIR CARMICHAEL: All right, any objections to that? All right, thank you, Ms. Fegley.

MR. WHITE: Fantastic. Moving on. Just take a moment. Another big win for the Data Team

was the Data Warehouse Spring Data Load. The dates are here. Essentially the highlight is there has been wonderful cooperation from all of your staff, as well as the ACCSP staff, to kind of come together, provide the information, the participants, the data itself, and get the information out and published on the Commercial Atlantic Coast Summaries by April 4. We keep kind of sneaking a little bit earlier in the year. This started as a preparation for the fisheries of the U.S. document, and for the last three years we've been on time to support not just that document, but folding into stock assessments for the Commissions and the Councils as well. The other nice thing about this particular task is the ACCSP data tables here are the source of landings queries that get sent by computer on a nightly basis, to NOAA Headquarters, the GARFO Fisheries Dependent Data Initiative Warehouse, and the Southeast Fisheries Science Center.

That is important, so that when the public or your staff go to make a query, they should get pretty close to the same answer for landings, whether they're going to ACCSP or one of those federal data sources to do their query on landings. That does diverge a little bit when you get to assessments and bycatch and discard information. But at least from the landings catch information that's been a big focus over the years, to get the same answer out of multiple datasets, because they use the same underlying source.

We're excited about that. On the recreational side, MRIP has released updates to the 2020 and 2021 information. Within about five days of their release, we were able to load it on the ACCSP website as well, so that participants can query both the recreational and commercial data from the same location. On the recreational side, we'll start with the MRIP and the state partnerships for data collection.

I already mentioned the MFA increase of \$900,000.00 per year. That is about 2,306-hour sampling assignments on the Atlantic Coast added each year. The table shows kind of the previous base number of assignments by states. How many

were add-on, what those percentage increases were. But it's about a 30 percent increase to the site assignments.

That has been a really good collaboration between NOAA, the ACCSP staff, and the states about what they can handle for staffing, what the best place to put those is to capture offshore information, species that have a little bit more concerning PSEs, as well as really focusing on the private boat modes to do that. Under the FHTS, the For-Hire Telephone Survey, the states are continuing to conduct that.

The vessel directory has had several updates, and as I mentioned, there is calling efficiencies by not calling vessels that are already submitting logbooks. There has been a tighter integration by MRIP staff within the vessel directory, to pull some permit information, either from HMS or from the Regional Offices, to kind of call the folks that are necessary, but not to call when they're already doing logbooks.

Another shutout here on the Social Economic Survey, the SES add-on for 2022, this is done about once every five years. This year we were able to plan, last summer in fact, for the development of adding that part of the survey to the tablet field staff application. That went really well as a collaborative process.

The software itself is being used by both the Atlantic and the Gulf states, so efficient use of MRIP funds there. In the data collection that started in January and February, at least for North Carolina, and then the other states have jumped in on Wave 2, and now we've got the whole coast for Wave 3. So far, it's been about 70 percent completion rate by anglers of the SES Survey. That's a pretty high completion rate that is a testament to kind of the programming, the functionality, as well as the staff that are rally making it happening out there in the field. Thanks to all of that, and we have certainly shared the software that ACCSP developed with the Gulf states, so that at least

for Florida, Mississippi and Alabama, they're using the same web tools that we have developed, the same tablets out in the field, and that helps standardize the data submission to MRIP. We're excited about that.

As a result of the Modern Fish Act there is an additional report that MRIP needs to send back to Congress. They did ask us to include some information in our annual report about that. We've had a collaborative process to pick these species that have categories of species, so a common, a pulse rare event, a state or inshore species and a federal offshore species.

We actually expanded. We went above and beyond and picked six species, not four. The idea here is to look at kind of a regional ten-year graph of what's happening. Without naming the species, here is a common Atlantic closed species. The blue bars actually include the confidence intervals. Look at that, Dan, we're already ahead of you, for listening to you, I should say.

The blue bars are the coastwide, the regions for North Atlantic, Mid-Atlantic and South Atlantic are represented in the smaller bars, and then total harvest would be represented that way. Then the lower pane is the actual track of the PSEs. We intentionally chose the 20/40/60 line, so 20 percent PSE is kind of a historical.

If it's below that that supports data usage, that 20 to 40 or 40 to 60 is areas for improvement. We're hoping by going back five years and then looking forward five years, we'll see some trends in the additional sampling effort showing some improvements in PSE and confidence intervals. We've also been working up and down the coast on One Stop Reporting.

The graphic here was part of one of the ACCSP outreach items, but again, this is enabling fishermen to submit one report for all of the requirements of their associated permits. If you've got a GARFO, a SERO, and an HMS permit, and you're doing a

commercial or for-hire trip, that should not be three different reports.

Can it come in once and then get distributed by ACCSP or others to the appropriate entities? This was a big need to get implemented for the November GARFO electronic reporting implementation. We had the software out there at the time. Now that fishing is ramping back up as the weather warms up, this is coming to fruition.

Just a pat on the back to both the developers, as well as all of the Agency staff that were involved in making these agreements. There has been a bit of give and take on what data field had to be collected over everything else. But SAFIS e-trips is the first OSR reporting option that is available. We are somewhat excited about that. Joe, did you want to say something? I saw your movement, or keep going?

CHAIR CARMICHAEL: How about online? We're good.

MR. WHITE: No hands online at this point, oops, Lewis Gillingham has his hand up. Go ahead, Lewis. His hand went back down. Now I'm going to slow down a little bit here. We made some good progress on slides though. One of the questions by the Coordinating Council has been, what are the ACCSP software development projects that are coming up? This is where the software team has had some turnover and growth over the last six months. Really wanted to look at three major areas of what's going to be the next piece of work that gets focused on, as a major new item.

One of those is Electronic Dealer Reporting Redesign, Registration Tracking is another, how internally the database handles all of the people, businesses, vessels, permits, et cetera that are associated with all of the dealer reports and landings, and trip reports. That is kind of

crucial to how everything else functions, and how you can query the data back out.

Then the third is the Species Tree, and we've done a lot of work in e-Trips, to identify splitting out how things work. One of the reasons that Species Tree was important, was right now the list of species that can be landed on a dealer report are the same list of species that are in on a fisherman trip report.

Of course, once it is on the trip report it's true for a commercial or for-hire, a recreational type trip. By splitting out the Species Tree we can actually shorten the lists, and make it appropriate for the people that are reporting in that zone. Of course, it's another one of those items that touches everywhere.

As we look to this process, we recognized internally, and I wanted to put on screen, the long list of ongoing work in software maintenance that we're not saying no to, we're just continuing that, maybe not in the background, but without as big of a focus. Those are things that also impact staff time.

Lewis, I do see your hand up, but I'm going to finish two more slides and then come back to that. In this evaluation we looked at six different categories. It was a pretty robust process, but looking at what the functionality of the new software, what would the timing be, what is the background work testing development and production?

What are the resources, either for ACCSP staff or a contractor, and time, what might be constraints, contributors or dependencies? After all of that, and a very awesome spider web design that Julie helped us kind of visualize what was going on. The staff came up with these priorities in this order, and then they were presented to the Information Systems Committee, as well as the Operations Committee.

It was really to look, as Development Year 2022, to look at the Species Tree, and implement that as a way to make reporting easier, faster, better now, and data quality, for release on January 1, 2023, including some of the lobster tracking information.

The aspect of work in 2023 would be to do the underlying database work for registration tracking, and release that to our production application in January, 2024.

Then spend 2024 working on the Electronic Dealer Reporting Redesign, and presenting that out in the production Apps, in January, 2025. Now we recognize that that feels like a long way away. We've built in the ideas that online, mobile and file upload will all have to be released at the same time, coordinating out the different aspects of testing. While there is a significant thousands of hours of programming and development time in this, there is also time to allow for testing, revision, fixing before it gets released out to production. These timelines look long, and we got immediate questions from the Committees on, whoa, that feels like it's really long. About 15 minutes later they were like, is this too aggressive?

It was a really good process that was followed to get committee input. I wanted to put this out in front of the Coordinating Council, so that you're aware of these internal timelines and priorities as we've developed them. At this point, I should probably pause and ask for comment, and Lewis has dutifully had his hand up, so we'll call on Lewis first.

MR. LEWIS GILLINGHAM: I just wanted to say that the question that John Clark, anytime I'm around any of the for-hire I get that all the time. About all I can tell them is, yes, we're making progress, but I can't see exactly when. But then your next slide that showed, hey if you use this SAFIS.

Basically, that means you've accomplished a good deal already, in terms of multiple reports. I would just ask if you could make that nice, neat little card or outreach materials, or get it to our APAIS people there in the field, and likewise to the commercial folks that do the stock assessment sampling. Thank you.

MR. WHITE: Thank you, Lewis, I see no other hands online, Mr. Chair.

CHAIR CARMICHAEL: Yes, I think that's a good point about letting people know about this. You're making good progress on SAFIS e-Trips and One-Stop Reporting. Letting people know is always important. You can't ever do enough outreach. Any other questions from around the table? I am seeing none.

MR. WHITE: Thank you, we will keep going. I just have a couple left in the Program Updates. I did want to highlight that for the current year the total ACCSP funding turned out to be 3.53 million. The word there is including the FIN-crease, so the Fisheries Information Networks got a particular line-item increase across the Atlantic, Gulf, and other areas, Pacific, et cetera.

That came through in the ACCSP Grant, and of course last October the Coordinating Council approved these 10 partner projects. All of them were funded and they got their receipt letters in March at the full funding level. That worked out pretty well. I know there was concern back in October, as to whether the projects could be funded at the requested amounts or not.

I wanted to make sure that you are aware that they were. This adds in that the FY2022 Administrative and Operations Proposal, so thank you to Kathy for suggesting that name in the October meeting minutes, so we added that in here instead of just the Admin Grant. But it was ultimately approved at the 2.2-million-dollar level, because of some products that were not funded, as well as a change in the Commission indirect for the benefit of ACCSP.

There is about \$100,000.00 that is left unallocated in the Admin and Operations budget at this time. We are in Year 2 of 5, and so the decision was made to kind of park that and allow for the leadership team to kind of provide direction on that at a future date. Then finally, I'm very excited to say that all of our staff positions are filled at the moment. We had some staff turnover last fall. We hired three

new data coordinators that started in November. Some of our new staff were able to make it over here today, if you don't mind standing up. We'll give you a quick wave. Anna-Mai Christmas-Svajdenka is here, she is one of our new data coordinators.

We also have Jennifer Ni, Mike Rinaldi, and maybe I'm not seeing that far, but that are here today. The other data coordinators that were added, Adam Lee joined on the data team with Anna-Mai. We have Gabe Thompson, who joined the recreational team, and then there was discussion last year of backfilling one of the software positions, and of course adding another software programmer.

That hiring process was initiated in the fall, but we didn't complete all those rounds, and so in March, middle of March, we were able to hire Daniel Mestawat and Jamal Oudiden, and they are with us and helping out with some of the software programming as of March 16. If you would like to take a chance to look at any of us and see what we all look like, now that we're coming back in person, our staff page has been updated to have everybody on it.

I would be remiss if I didn't mention Information Systems and Security. We are doing really well in keeping updated on our Oracle stable releases. We did a network modernization project between your last meeting and now. That is new. We got upgraded bandwidth to the office, for which was a big increase in functionality, and we got that for zero cost, so bonus for us.

We also replaced kind of a hardware components to keep the network flowing and going. The router, the firewall, the switches, kind of the guts of how it works. That's important because with all of the worldwide cyber security issues we are not in an excellent place to block a lot of unwanted traffic.

We also implemented a lot of redundancies, so if one point in that whole system has a hardware or software failure, that would be transparent to the end users, and the system should mostly stay up. We're excited about that, and with FISMA, the Information Security Management Act, we are just finishing up our annual external audit, and overall have a pretty strong security posture, so we're getting good feedback from our external audit at this point, so that is it for the Program Updates.

CHAIR CARMICHAEL: Thank you, Geoff. Any questions, anybody online? I don't see any around the room. That brings us to Other Business, and I understand we do have a bit of other business, another presentation.

MR. WHITE: Do you want me to do those or are you going to?

OTHER BUSINESS SCIFISH UPDATE

CHAIR CARMICHAEL: I'll go ahead and hit them up. Just a quick update on the project. It's called SciFish. This is something that's been worked on for a little while through a number of projects that have been funded, and the idea is really to come up with a tool. It was directed towards citizen science projects, and to be kind of an interactive, essentially, App builder, so that ACCSP projects and other partners are not having to continually go to an App designer and have an App built. It will provide consistency, and it also ensures that the data collected meet ACCSP standards, and can get into the ACCSP system, and you know that we really leverage the money spent on developing a project into ways to develop projects and applications for multiple partners down the road, because there seems to be no end to the interest in Apps these days. Everywhere you go somebody wants to create an App and solve our fisheries data collection problems.

A couple key points about SciFish, as it's called, is administered through ACCSP, so it is available to all partners. The project that's been underway right

now and the development scoping meetings, questionnaire, lots of participants, lots of people involved trying to understand what are the needs out there amongst the different partners, and how might something like this be used.

What is the interest in doing a project like this? There have been multiple partners involved in the development of it for quite a while. Really the next step then is to get some guidance from the Coordinating Council on sort of where it goes next. What are the policies going to be? How is this program going to be used? Just to provide some guardrails for working with it.

What the group has asked for is that we have a virtual meeting of the Coordinating Council, where we can look at SciFish, its development, its future direction, what it will be providing us. To look at that in detail, and provide the guidance that they would like. You will be hearing from folks from this group.

They want to hold a meeting, it looks like they're talking about in late June if we can, maybe the week of June 20th. If that is possible then look for a doodle poll and some more information, to try and schedule a webinar meeting of this group. At that time, we would be providing input. This is just a heads up, so if you see that e-mail coming you don't wonder what it is, and think it's spam.

It is a legit thing, and I think this is going to be a pretty good tool in the ACCSP toolbox, as we move forward as a way to really get Apps done much more efficiently, and you know people can go in and do an App, maybe get a small piece of data from a small fishery that is not getting sampled as well as we would like, and do it very efficiently. Yes, Geoff.

MR. WHITE: Just for clarity. The intent was to have the Leadership Team participate in the webinar, but if there are other members of the

Coordinating Council that wanted to participate, just please let us know.

CHAIR CARMICHAEL: Okay, yes, thanks for that clarification. Not everybody will be on tap, but everyone is welcome, of course. We'll dig into it in detail, then I think this would be a report out back in October as well from the Leadership Team?

MR. WHITE: Likely, yes.

CHAIR CARMICHAEL: Some more of that in October. Any questions from the group? I'm not seeing any here, so how about online?

MR. WHITE: No hands online. We got back on time.

CHAIR CARMICHAEL: Good job, okay. Is there any other business? I see none, any hands online?

MR. WHITE: No hands online.

CHAIR CARMICHAEL: All right, thank you everybody for muddling through our few growing pains here with the technology. Hopefully we've got it all worked out for the Commission meeting to come, and appreciate the patience of folks who were online. I think we got around to everybody. A few delays, but all in all pretty good job.

ADJOURNMENT

CHAIR CARMICHAEL: Thank you everyone, and we stand adjourned.

(Whereupon the meeting convened at 11:48 a.m.
on Monday May 2, 2022.)



Atlantic Coastal Cooperative Statistics Program

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FY23 Proposal Recommendations to Coordinating Council

From the Operations and Advisory Committees

- Request that the Coordinating Council determine the appropriate avenue, such as an existing committee or new working group, for reviewing the potential to create guidance for the RFP on funding for application development, what data are being collected, how those data will be used, method of collection, duplication of effort, and to whom those data are being transmitted.
- Maintenance Proposals
 - Recommend to fully fund all proposals.
- New proposals
 - Recommend to fully fund all proposals.
 - The groups had discussion on the following topics for the proposal: Collection of Recreational Fishing Data from Citizen Science Sources. They recommend fully funding the project.
 - There were questions about setting precedent on paying a private entity for data, not having oversight or input on how the data are collected, and how this approach fits with the concept of citizen science. Note that in this pilot funding is being requested for development/programming, but FishBrain is waiving their data licensing fees for this year.
 - How does this fit in with SciFish (ACCSP citizen science module)?
 - Request that the PIs incorporate into their outreach efforts continued understanding and participation in MRIP surveys, explaining citizen science, and how the data may be used (manage expectations).
 - Note that the Accountability Workshop proposal was difficult to rank given the nature of the project. These groups appreciate the transparency by ACCSP staff and the Accountability Work Group; however, recommend that ACCSP workshops or other similar activities be included as optional in the Administrative Grant in future years.

** all above are consensus decisions*

Our vision is to be the principal source of fisheries-dependent information on the Atlantic coast through the cooperation of all program partners.



FY2023 Proposal Rankings (Average)

	Admin Grant	2,206,609	\$44,423	2,251,032
3.35M	Maint @ 75%	824,226	New @ 25%	274,742
3.50M	Maint @ 75%	936,726	New @ 25%	312,242

Project Name	Partner	Score	Cost	Cumulative Cost	3.5M Amt Remaining	3.35M Amt Remaining
Advancing Fishery Dependent Data Collection for Black Sea Bass (Cetropistis striata) in the Southern New England and Mid-Atlantic Region Utilizing Modern Technology and a Vessel Research Fleet Approach	RI DEM	8.96	\$ 88,152	\$ 88,152	\$ 848,574	\$ 736,074
FY23: North Carolina biological database enhancements for the transmission of data to the ACCSP	NCDMF	8.40	\$ 146,981	\$ 235,133	\$ 701,593	\$ 589,093
Electronic Trip-Level Reporting for the Potomac River Fisheries Commission Commercial Fisheries Sector	PRFC	8.04	\$ 215,328	\$ 450,461	\$ 486,265	\$ 373,765

includes carryover from maintenance projects

Data modernization and improvements to the New York Data Flow	NYDEC	53.48	\$ 33,882	\$ 33,882	\$ 764,625	\$ 614,625
Pilot Observer Program for Rhode Island State Waters Gillnet Fishery	RI DEM	51.24	\$ 118,520	\$ 152,402	\$ 646,105	\$ 496,105
FY23: Expansion of the FISHstory Citizen Science Project	SAFMC	50.88	\$ 87,569	\$ 239,971	\$ 558,536	\$ 408,536
Support for ACCSP Accountability Work Group Recommendation Implementation	ACCSP	48.13	\$ 49,976	\$ 289,947	\$ 508,560	\$ 358,560
Collection of Recreational Fishing Data from Citizen Science Sources	RI DEM	41.25	\$ 134,000	\$ 423,947	\$ 374,560	\$ 224,560
North Carolina socioeconomic database construction for the management of current and future data	NCDMF	37.72	\$ 145,020	\$ 568,967	\$ 229,540	\$ 79,540

	Partner	Title	Primary Module	Others	Cost	Max Funding Year 5/6	
MAINTENANCE	1	RI DEM	Advancing Fishery Dependent Data Collection for Black Sea Bass (Cetropristis striata) in the Southern New England and Mid-Atlantic Region Utilizing Modern Technology and a Vessel Research Fleet Approach	Biological (50%)	Catch/Effort (25%), Bycatch (25%)	\$ 88,152	\$ 88,153
	2	PRFC	Electronic Trip-Level Reporting for the Potomac River Fisheries Commission Commercial Fisheries Sector	Catch/Effort (100%)		\$ 215,328	
	3	NCDMF	FY23: North Carolina biological database enhancements for the transmission of data to the ACCSP	Biological (100%)		\$ 146,981	
				Total Maintenance	\$ 450,461		
New	1	RI DEM	Pilot Observer Program for Rhode Island State Waters Gillnet Fishery	Bycatch (80%)	Catch/Effort (20%)	\$ 118,520	
	2	NCDMF	North Carolina socioeconomic database construction for the management of current and future data	Socioeconomic (100%)		\$ 145,020	
	3	NYDEC	Data modernization and improvements to the New York Data Flow	Catch/Effort (100%)		\$ 33,882	
	4	SAFMC	FY23: Expansion of the FISHstory Citizen Science Project	Catch/Effort (50%)	Biological (50%)	\$ 87,569	
	5	RI DEM	Collection of Recreational Fishing Data from Citizen Science Sources	Catch/Effort (100%)		\$ 134,000	
	6	ACCSP	Support for ACCSP Accountability Work Group Recommendation Implementation	Catch/Effort (100%)		\$ 49,976	
				Total New	\$ 568,967		
Admin	ACCSP	ACCSP Administrative Budget	Admin		\$ 2,206,609		
				Grand Total Proposed	\$ 3,226,037		

Proposal for Funding made to:
Atlantic Coastal Cooperative Statistics Program
Operations and Advisory Committees
1050 N. Highland Street, Suite 200 A-N
Arlington, VA 22201

Advancing Fishery Dependent Data Collection for Black Sea Bass (*Centropristis striata*) in the Southern New England and Mid-Atlantic Region Utilizing Modern Technology and a Fishing Vessel Research Fleet Approach

Submitted by:

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Applicant Name: Rhode Island Department of Environmental Management (RI DEM) and the Commercial Fisheries Research Foundation (CFRF)

Project Title: Advancing Fishery Dependent Data Collection for Black Sea Bass (*Centropristis striata*) in the Southern New England and Mid-Atlantic Region Utilizing Modern Technology and a Fishing Vessel Research Fleet Approach

Project Type: Maintenance (Year 5 of Maintenance)

Requested Award Amount: \$88,152

Requested Award Period: August 1, 2023 – July 31, 2024

Principal Investigators: Jason McNamee, PhD, Deputy Director of Natural Resources, Rhode Island Department of Environmental Management, David Bethoney, PhD, Executive Director, Commercial Fisheries Research Foundation; Thomas Heimann, MsC, Research Biologist, Commercial Fisheries Research Foundation

Date Submitted: June 15, 2022

This is the fifth maintenance proposal to support the continued data collection by the Black Sea Bass Research Fleet. There are no major changes to the scope of work proposed in the current proposal compared to prior years. The primary changes to this proposal include updated timelines throughout, updated fleet composition in the *Fishery-Dependent Data Collection* subsection, updated data in the *Internal Data Analysis* subsection, and the proposed budget. In addition, more details have been added to the *Outreach and Education* subsection to better illustrate what has already been accomplished in this context during the duration of this project so far.

Objective:

This proposal is a request for financial support for an additional 12 months of biological catch, effort, and bycatch sampling by the Black Sea Bass Research Fleet, which was successfully piloted in 2016 with support from ACCSP and has been in continuous operation since. Since the first year of funding provided by the ACCSP, the Research Fleet has sampled 41,614 black sea bass from 2,301 locations throughout the inshore and offshore fishing grounds of southern New England and the Mid-Atlantic. The Research Fleet will continue data collection through July 31, 2023 (Year 6 of funding from ACCSP). All biosamples data collected by this project during previous years of funding have been communicated to and accepted by ACCSP bi-annually. This data is being utilized in the current Black sea bass stock assessment with direction for expanded use expected to be provided by stock assessment scientists. The project team will continue to deliver data to ACCSP in this manner throughout Year 6 of funding, and the proposed project will allow for the continued delivery of black sea bass biosamples data to ACCSP at six-month intervals through July 31, 2024.

The goal of the proposed project is to continue the Research Fleet's sampling efforts to develop a year-round, long-term time series of black sea bass (*Centropristis striata*) catch, bycatch, and biological data for five different gear types (trawl, lobster/crab pot, fish pot, gillnet, rod and reel) throughout the Southern New England (SNE) region and reaching into the Mid-Atlantic (MAB) region. The continuation of this project is critical to the evolution of black sea bass assessment and management efforts by the Atlantic States Marine Fisheries Commission, Mid-Atlantic Fisheries Management Council, Northeast Fisheries Science Center, and Atlantic Coastal Cooperative Statistics Program as the Black Sea Bass Research Fleet produces spatially and seasonally distinct catch data for numerous commercial and recreational gear types, which is currently lacking for this species.

Project components include: 1) Continue the existing fishery dependent data collection program that utilizes fishing vessels and a custom designed sampling application to collect and relay biological catch and bycatch data (number, length, sex, disposition) and fishery characteristics (location, gear type, effort, habitat) for black sea bass from across the SNE/MAB region throughout the year; 2) Internal data analysis to address research questions about spatiotemporal patterns in black sea bass biological and fishery characteristics and gear-specific selectivity; and 3) Communication of project data and results to the Atlantic Coastal Cooperative Statistics Program (ACCSP), black sea bass stock assessment scientists, managers, and members of fishing industry.

In summary, the general goals of the proposed project are:

- 1) Collect and communicate critically needed fishery dependent black sea bass data (catch and effort, bycatch, and biological) in a cost-effective way using modern electronic technology and fishermen's time on the water;

- 2) Contribute to the evolution of the northern Atlantic black sea bass stock assessment and associated management measures;
- 3) Demonstrate a model for fishery dependent data collection, management, analysis, and utilization that can be duplicated in a cost-effective way in other regions of the black sea bass range and in other fisheries.

Specific objectives include the following:

- Continue the Black Sea Bass Research Fleet for an additional 12 months to further refine seasonal characterizations of northern Atlantic black sea bass biology and distribution;
- Collect fishery dependent black sea bass data from five gear types (trawl, lobster/crab pot, fish pot, gillnet, rod and reel) across the SNE/MAB region to characterize the size and sex distributions of black sea bass catch and bycatch and investigate the spatial and temporal trends of the fishery;
- Maintain and evolve the On Deck Data application to meet the data needs of scientists and the logistical needs of participant fishermen;
- Communicate black sea bass biosamples data to ACCSP every six months;
- Ensure all project data is available to Northeast Fisheries Science Center (NEFSC) scientists for inclusion in Black Sea Bass Stock Assessments
- Conduct internal analyses of the project database to: 1) Assess the selectivity and CPUE of five gear types in the SNE/MAB region and explore temporal variability, and 2) Further monitor and assess spatial and temporal trends in species' catch and bycatch composition and fishery characteristics;
- Further refine gear-specific fishery dependent indices that utilize different data error structures, standardization techniques, and Bayesian applications;
- Communicate to a broad audience the benefits and inherent value in this type of collaborative data collection program.

Need:

As asserted in the ACCSP Biological Review Panel's biological sampling priority matrix, black sea bass is identified as a top priority species for data collection, receiving the highest total priority ranking for inadequate biological sampling (ACCSP 2022), and the species remains a high priority for managing stakeholders (ASMFC, NMFS, and state agencies). In recent decades, the distribution and center of biomass of black sea bass has been experiencing a northward shift, likely due to climate change (Bell et al. 2014). As a result, the lack of adequate data for northern Atlantic black sea bass in particular is an issue of regional importance, as this highly valuable stock ranges from Cape Hatteras to the Gulf of Maine (Musick & Mercer 1977, Moser & Shepherd 2009). In part due to the dearth of data throughout the black sea bass range, assessment and management efforts have been slow to react to the shifting distribution of the species and growing abundance of the northern stock (Bell et al. 2014, NEFSC 2017). As stated by ASMFC (2019), high priority data needs for black sea bass include increased sampling of

commercial landings and sample size of observed charter trips. The Black Sea Bass Research Fleet has, and will continue to with additional funding, provide precisely this information. Ultimately, cost-effective sampling programs, such as the Black Sea Bass Research Fleet, are needed to collect these data on regional scales and inform and evolve the stock assessment to consider the complex life history and ever evolving spatial structure of black sea bass.

Fishery dependent data has become an important source of information that is used as a term of reference for many stock assessments, but in the case of the northern Atlantic black sea bass stock, the data generated by the Black Sea Bass Research Fleet serves as the only systematically collected fishery dependent data source with a focus on the data being used in the assessment process. Thus, this project seeks to strengthen the fishery dependent data for this population to provide better information from across the temporal and spatial distribution of the northern stock.

The limited coverage of optimal black sea bass habitat and semi-seasonal (spring/winter) sampling schedule of the NEFSC trawl survey may limit the suitability of the survey data for the stock assessment (ASMFC 2013) and require the addition of new data streams to improve the information available to assessment. Recent stock assessments for the southern Atlantic black sea bass stock have adapted sampling and analytical techniques to better fit the life history and habitat associations of black sea bass. These stock assessments rely heavily on fishery-dependent data collected from multiple commercial and recreational fleets representing multiple gear types to inform the stock assessment model using data such as annual length compositions of landings and discards, gear selectivity curves, and indices of abundance (SEFSC 2013; SEDAR 2018). Such fishery-dependent parameters, however, have not yet been developed for the northern Atlantic black sea bass stock due to insufficient data, but will become possible if the Black Sea Bass Research Fleet is able to amass a robust time series of data. This project aims to address this need by maintaining the existing Black Sea Bass Research Fleet to conduct year-round biological sampling of black sea bass fishing effort, catch composition, and discard composition within the trawl, lobster/crab, fish pot, gillnet, and rod and reel fisheries in the SNE/MAB region. The northern Black Sea Bass Research Track Stock Assessment is currently underway, and the Working Group has been evaluating the Black Sea Bass Research Fleet data to determine how best it can be utilized in the upcoming assessment. Continued data collection that extends the timeseries and increases sampling coverage for gear types and times of year under-sampled by other data sources will ensure that the data continues to become more useful to each successive stock assessment.

Ultimately, the proposed project will help meet ACCSP's mission of improving data quality for fisheries science. In addition, this project, and its integration with the ACCSP data housing program, will lend to the other mission of the ACCSP, namely by contributing to a single data management system that will meet the needs of fishery managers, scientists, and fishermen.

Collecting timely scientific data across a species range is imperative for successful fisheries management, as more robust data enables fisheries science to be as comprehensive as possible, which in turn supports informed and efficient decision making by managers. Furthermore, stock assessment scientists rely on robust biological, catch and effort, and

Rhode Island Department of Environmental Management & Commercial Fisheries Research Foundation

ACCSP Funding Proposal (Maintenance Project – Project Year 7, Maintenance Year 5): Fishery Dependent Sampling for Black Sea Bass

(*Centropristis striata*)

Proposal components that address the ranking criteria are underlined and a summary is provided on pages 30-33.

bycatch data to help improve the quality of stock assessments. In these ways, the proposed project meets all the main elements of the mission of ACCSP.

Results and Benefits:

The results of the proposed project include:

- Improved quality, quantity, and timeliness of biological, catch and effort, and bycatch data for the northern Atlantic black sea bass, made available via the ACCSP;
- A vetted source of year-round black sea bass data that can be used to inform the stock assessment and management of this data poor species;
- Coordinated data transmission procedures with the ACCSP that follow the CFRF's existing data communication practices with ACCSP;
- A demonstrated, cost effective, method to collect data for a commercially and recreationally important species from areas and times of year not accessed by existing survey programs;
- Improved collaboration and trust between fishermen, scientists, and managers;
- Improved accuracy and credibility of the stock assessment and management plan for the northern Atlantic black sea bass stock;

The benefits of the proposed project are:

- Address priorities of ACCSP by providing critically needed black sea bass data from the SNE/MAB region to support assessment and management efforts that reflect the current state of the resource;
- Provide an efficient and constructive way for fishermen to be involved in the scientific process by using modern technology to collect quantitative black sea bass data during routine fishing practices;
- Fill black sea bass data gaps in areas, habitats, and times of year not covered by standard survey techniques;
- Evolve and improve the black sea bass stock assessment by providing expanded biological data from retained and discarded black sea bass from a variety of gear types;
- Support regional science and management agencies, including ACCSP, ASMFC, MAFMC, and state agencies in their efforts to sustainably manage the black sea bass resource;
- Support diversification and resilience of fishing communities in the many states across the Atlantic coast with a black sea bass fishery;
- Provide a model for cost-effective fishery dependent data collection efforts in other regions and fisheries.
- Build strong working partnerships between fishermen, scientists, and managers that will contribute to the sustainable management of the nation's living marine resources;
- Build confidence in the efficacy of the northern Atlantic black sea bass stock assessment and management process.

Data Delivery Plan:

An important component of the proposed project is the compilation and communication of fishery and biological data to the ACCSP, participant fishermen, stock assessment scientists, and management teams, which will allow this project to have the greatest impact on black sea bass management as possible. The CFRF will maintain the black sea bass database for internal project analyses (described below) but will also regularly share the project data with other users, regardless of any internal publication endeavors.

Copies of the black sea bass database will continue to be sent bi-annually (every six months) to the ACCSP. These data will be compiled in a format that is compatible with the ACCSP database to encourage data be readily used in the black sea bass stock assessment and other analyses. Data submissions to the ACCSP will build upon the established procedures from the first five years of the project. All data provided to the ACCSP will match ACCSP data collection standards and any requested and available metadata will be provided. Throughout the project, data will also be made available to fishery scientists at the NMFS Northeast Fisheries Science Center. A vessel ID system will be used to maintain the confidentiality of participant fishing vessels. The CFRF will maintain open communication with the ACCSP data coordinator and will remain available to provide any necessary information along with data submissions.

To provide regular feedback to fleet participants, the project team will compile and distribute individual data reports to vessel captains every three months (quarterly). Vessel-specific data reports will include the raw data collected by that vessel during the reporting period as well as the following summary statistics: number of catch sampling sessions, amount of effort sampled (number of trawls, hooks, traps, etc.), average depth of sampling, percentage of black sea bass catch retained for sale, percentage of black sea bass catch discarded, number of black sea bass biologically sampled, sex distribution of black sea bass sampled, minimum/maximum length of black sea bass sampled, and average length of black sea bass sampled. Additional summary statistics will be available upon request. Data reports were compiled and distributed to Research Fleet participants following the above-mentioned quarterly time frame and content guidelines throughout the entirety of past project sampling.

Completed Data Delivery to ACCSP:

During the first funding year of the project, the CFRF and RI DEM worked with the current ACCSP Data Coordinator to coordinate data formats, metadata, and delivery procedures for the Research Fleet's black sea bass biosamples data. In addition, in year 4 of the project, the project team worked with the ACCSP Data Coordinator to update the Black Sea Bass Research Fleet data submission to follow the updated ACCSP biosamples data format. As a result of these efforts, all black sea bass biosamples data collected to date through the funded project have been incorporated into the ACCSP black sea bass biosamples database. The CFRF has maintained the bi-annual data submission to the ACCSP and submits data in January and July of each sampling year. The project team will maintain a bi-annual data delivery schedule to ACCSP

throughout the proposed project following the same data formats and standards previously established, as well as any requested updates from ACCSP.

Currently, the Research Fleet collects a suite of additional effort data beyond that which is included in the biosamples data (Table 1). To present, this effort data has not been included with past data submissions as the biosamples database at ACCSP is not set up for its inclusion. Continued efforts will be made by the CFRF and RI DEM to incorporate and share all effort data, including retroactively, with the ACCSP.

Approach:

The proposed project seeks to collect, communicate, and analyze critically needed catch, bycatch, and biological data for incorporation into the ACCSP biosamples database and ultimate application in the northern Atlantic black sea bass stock assessment. Project components include: 1) Maintenance of the current Black Sea Bass Research Fleet; 2) Collection of fishery-dependent biological (catch and bycatch) black sea bass data and fishery characteristics for 12 months in the SNE/MAB region; 3) Internal data analysis to address research questions about spatiotemporal patterns in the black sea bass population and fishery; 4) Compilation and communication of project data and results to ACCSP, stock assessment scientists, and fisheries managers; and 5) Outreach and education activities to share findings. Methodological details are outlined below.

Maintenance of Black Sea Bass Research Fleet and Data Collection App:

During the first funding year of this project, the CFRF and RI DEM were successful in developing the Black Sea Bass Research Fleet for fishery dependent data collection, including the development of a Project Steering Committee, solicitation and selection of participant fishing vessels, development of the On Deck Data application and SQL database, refinement of sampling protocols, construction of sampling equipment, training of Research Fleet participants, on-time initiation of data collection, data delivery to ACCSP and professional and industry outreach. The project was implemented by the PIs, CFRF staff, and a Project Steering Committee, which consists of members of the fishing industry as well as state and federal fisheries scientists and managers. Currently the project is run by the PIs and CFRF staff, and the project steering committee serves in an advisory role and provides feedback on project progress and major milestones as needed. More information about project accomplishments is available on the project website: www.cfrfoundation.org/black-sea-bass-research-fleet.

If funded, during the seventh year of the project, the CFRF and RI DEM will maintain all active fishing vessels supported through year-6 funding from ACCSP. It is important to maintain the current members of the Research Fleet for as long as possible. Ultimately, when data will be applied to the stock assessment or validated in regards to other sources of black sea bass data, having participation from the same vessels throughout the time series will allow project staff to investigate potential vessel effects evident in the data. The sampling rate of the Research Fleet

is dictated by the highly seasonal variation of black sea bass catch and bycatch in various fisheries across southern New England and the Mid-Atlantic. As a result, the sampling rate by the Research Fleet fluctuates from year to year. If funds become available due to normal fluctuations in Research Fleet sampling, project Co-PIs will evaluate the possibility of expanding the Fleet to include more vessels. Thus, when possible, and if funds permit, the Research Fleet may be expanded during the proposed project through an open application call for new vessels.

The black sea bass data collection application, On Deck Data, was developed during the first year of the project to enable Research Fleet participants to collect standardized black sea bass data as well as day-to-day observations. On Deck Data prompts participant fishermen to record a suite of session data (location, depth, etc.) and biological data (length, sex, disposition) while at sea. To account for the multi-gear nature of the black sea bass fishery, On Deck Data prompts gear-specific data entry for Research Fleet participants (Table 1). On Deck Data was originally launched during the first year of the project and has received various improvements and quality of life updates in each funded year to streamline data collection.

Table 1. Summary of fishing effort data collected by the Black Sea Bass Research Fleet.

Trawl	Gillnet	Commercial Rod & Reel	Charter	Lobster/Crab Traps	Fish Pot
Mesh Size (inches)	Number of Net Panels Per String	Time Spent Fishing (hours)	Time Spent Fishing (hours)	Soak Time (days)	Soak Time (days)
Tow Time (hours.decimal)	Length of Net Panels (feet)	Number of Rods Fished	Number of Rods Fished	Number of Traps	Number of Traps
Sweep Length (feet)	Mesh Size (inches)	Number of Hooks Used	Number of Hooks Used	Escape Vent Size (inches)	Escape Vent Size (inches)
	Soak Time (days)			Escape Vent Shape	Entrance Size (inches)
	Net Height (feet)				
	Tie Downs (inches)				

On Deck Data will be maintained throughout the proposed project to allow for efficient data collection and wireless data submission by Research Fleet participants. The CFRF and RI DEM will continue to work with an application developer to address any issues that arise and to update On Deck Data to maintain functionality. Application maintenance is a constant task, as tablets regularly receive operating system updates that may impact On Deck Data functionality. On Deck Data has to receive regular updates to specifically allow for compatibility with accessing and uploading data via wireless internet on new versions of the Android operating system. Further, as tablet models receive minor hardware changes between annual models, reformatting screens of On Deck Data to display properly across tablet models is anticipated.

The Black Sea Bass Research Fleet will continue to follow the fishery-dependent sampling protocols implemented during the first year of the project to collect catch and effort, biological,

and bycatch data from the SNE/MAB region. The percentage of project effort devoted to each of these modules is as follows: Catch and Effort 25%, Biological 50%, Bycatch 25%. The estimated project effort devoted to biological sampling reflects the collection of black sea bass length and sex data by participant vessels during three trips per month for 12 months. The intention of data collection is to provide a biological characterization of the catch and discards of black sea bass from a variety of gear types in the SNE/MAB regions. The estimated effort devoted to the catch and effort module is based upon sampling during the open black sea bass fishing season, sub periods open to commercial fishery exist nearly year-round. Further due to the multi-gear nature of the Research Fleet, every vessel interacts with black sea bass as targeted catch or bycatch differently even during open periods. Finally, the project effort allocated to the bycatch module reflects sampling efforts conducted while the commercial black sea bass fishing season is closed and while participant vessels are targeting other species. Due to the low daily allocation through the summer and fall seasons in Rhode Island, there is still a large portion of bycaught black sea bass sampled after vessels have hit their daily limits.

Fishery-Dependent Data Collection:

The Black Sea Bass Research Fleet started collecting data on November 30, 2016 and, if this proposal is funded, will continue to do so utilizing the established sampling protocols and procedures through at least July 31, 2024 (through Year 7 of ACCSP funding). The Black Sea Bass Research Fleet currently consists of fourteen active fishermen based in Rhode Island and New Jersey, chosen strategically to provide data coverage from across the SNE/MAB region, throughout the year, from a variety of gear types. In 2021, one Fleet member, F/V Saturn (fish pot) retired from fishing. Three other participants, F/V Nancy Beth (gillnet), F/V Second Wind (offshore trawl), and F/V Blue Label and Virginia Bae (same captain; fish pot, gillnet), are also now considered “inactive” as they have not sampled for more than one year. The other vessels from the prior year’s proposal, F/V Johnny B (fish pot, rod & reel, lobster pot), F/V Laura Lynn (fish pot, rod & reel, lobster pot), F/V Matrix and F/V November Gale (same captain; lobster/crab pot, trawl, conch pot), F/V Priority Too (rod & reel, charter), F/V Sweet Misery and F/V More Misery (same captain; gillnet, lobster pot), F/V Debbie Sue (trawl), F/V Harvest Moon (fish pot, lobster pot), F/V X-Terminator (fish pot, gillnet), F/V Catherine Ann (fish pot, lobster pot), F/V New Hope (fish pot), F/V Ragged Edge (fish pot), F/V Savannah Paige (fish pot), F/V Saturn (fish pot). and F/V Brooke C (lobster/crab pot, fish pot, scallop dredge) have been maintained

The majority of samples have originated from statistical areas 537 and 539 as these two statistical areas exclusively cover the fishing grounds of the F/V Johnny B, F/V Laura Lynn, F/V Matrix, F/V Priority Too, and now F/V Catherine Ann, all of which are either seasonal fishing vessels or do not interact with black sea bass in the winter. The majority of inshore lobster, fish pot, rod and reel and gillnet samples come from the end of spring through the end of the fall when black sea bass are in highest abundances inshore in statistical areas 537 and 539. The F/V Brooke C fishes offshore and interacts with black sea bass heavily in the winter and spring months, however this vessel encounters black sea bass less frequently through the summer and

fall. The F/V X-Terminator and F/V Blue Label both fish seasonally and mostly inshore in state area 537 and were brought into the Fleet to expand the number of gear replicates in the gillnet and fish pot fisheries. The F/V Debbie Sue fishes further south than most of the Rhode Island based Research Fleet members and consistently completes trips into the MAB region south of Hudson Canyon. The F/V Savannah Paige and F/V Saturn, both based in New Jersey, primarily sample in statistical areas 620 and 621. In total, the Black Sea Bass Research Fleet has sampled black sea bass from 13 distinct statistical areas: 525, 533, 537, 538, 539, 611, 613, 615, 616, 621, 622, 626, and 632.

Participant fishermen will use Samsung Tab A tablets pre-programmed with On Deck Data, described above, to efficiently and accurately record and transmit fishery dependent data. As such, the proposed project will advance the use of electronic technology in at-sea biological data collection, management, and analysis efforts. The goal for each participant is to conduct at-sea catch sampling sessions during three fishing trips each month (Nelson 2014). Thus, across the 14 active vessels, the Black Sea Bass Research Fleet will aim to sample up to 42 trips per month, resulting in as many as 504 trips over twelve months. Given the population inferences implied in the project objectives and the aggregating nature of black sea bass, a biological sampling (length/sex) minimum of 50 black sea bass per location will be the required (Zhang & Cadrin 2012). With a goal of sampling three locations per month, the Research Fleet may sample up to 25,200 black sea bass over the course of the year.

The realized sampling frequency, however, will be dependent on a variety of factors, including weather, seasonal black sea bass distribution, and fishery closures. Further, due to the high seasonality of a large portion of the Black Sea Bass Research Fleet, fishery sampling frequency exhibits high seasonal fluctuations. Due to the multi-gear nature of the Research Fleet, the proposed sampling targets do not adequately represent the fishing schedules for each gear type. For example, due to the low daily catch limit (50 pounds per day per vessel for most of the year) in Rhode Island for black sea bass if a fishing vessel is only targeting black sea bass on a day trip and the limit is caught, all fishing ceases. This leads to instances where sampling 50 black sea bass per location becomes unfeasible as fishing may have already stopped prior to landing 50 black sea bass. Further, many of the larger trip vessels are mainly retaining their daily or trip limits of black sea bass from bycatch while targeting other species, which again leads to instances of fishing ceasing prior to 50 black sea bass caught. However, the goal of sampling 150 black sea bass per month remains to ensure statistical power. Vessels may sample fewer fish from more than three locations to reach the 150 fish per month target. Further, the same scenario occurs in highly mobile fishing gears, such as charter and commercial rod and reel, which will often change locations prior to catching 50 black sea bass. Both instances may lead to the potential for more numerous sampling locations with fewer fish from each location. Finally, the maximum target of 25,200 black sea bass would only be achievable if all Research Fleet participants operated year-round. Since many of the gear types represented within the Research Fleet stop fishing for the winter months, the realized sampling numbers are lower.

At each sampling location, participant fishermen will use On Deck Data to record the date, time, location, statistical area, depth, habitat type, target species, gear type, effort deployed (see Table 1), total number or pounds of black sea bass retained and discarded, and length, sex, and disposition of at least 50 black sea bass. Sampling date, time, and location will be automatically recorded by the internal tablet GPS. Standardized fish measuring boards will be used across the Research Fleet to ensure a consistent measure of fish length to the nearest centimeter. Data will be wirelessly uploaded to a MySQL database once a vessel returns to port and continually monitored by the project team. This data communication, review, management, and storage process was established and vetted during the first year of the project and has been implemented in each year since.

Scientific collector's permits, issued by RI DEM, will be obtained for vessels fishing within Rhode Island state waters to allow for black sea bass collection for laboratory sampling. These permits were successfully acquired multiple times during the first funding years of the project and will be extended through subsequent years of data collection and expanded to cover new Research Fleet participants. During the 2020 sampling year, it was decided to no longer obtain an Exempted Fishing Permit for Research Fleet sampling. The exemptions allowed for recreational retention regardless of closure periods and exempted commercial rod and reel and charter vessels from minimum size limits for sampling purposes. Neither of these exemptions were necessary for Research Fleet operation as no black sea bass are retained for laboratory sampling from federal waters. They also allowed for participants to keep undersized fish onboard longer than the time needed for sampling.

Internal Data Analysis:

As described above, the Black Sea Bass Research Fleet was able to operate effectively and deliver data in an efficient manner during the first five+ years of data collection, sampling over 41,614 black sea bass from 2,301 sampling sessions conducted from coastal Rhode Island into the MAB and east to George's Bank from November 30, 2016 to May 1, 2022 (Figure 1). These data are summarized in Table 2. The ultimate application of these data will be the black sea bass stock assessment. To achieve this goal, the project team has worked directly with steering committee members and black sea bass stock assessment scientists (Gary Shephard, NEFSC; Steve Cadrin, SMAST) since the beginning of the project to ensure that Research Fleet data is of the necessary quality and structure for utilization in the stock assessment. More recently, the project team has been regularly communicating with the Black Sea Bass Research Track Stock Assessment Working Group and attending all meetings to discuss the Research Fleet data, provide data summaries, and answer questions about the dataset, as the Working Group evaluates how this data can be incorporated into the upcoming assessment. Communication with the above listed stock assessment scientists will continue with the proposed project. Work with the stock assessment scientists will be focused on directly incorporating the Research Fleet data into the stock assessment, creating in depth gear selectivity models for the gear types represented within the Research Fleet and exploring the creation and incorporation of CPUE indices of abundance (including gear specific indices), both of which could be directly utilized in

the stock assessment. Further, the proposed work will include gear specific discard characterizations describing the length frequencies of discarded black sea bass from each gear type through both time and space, with the intention of providing a more accurate understanding of black sea bass discards for the stock assessment.

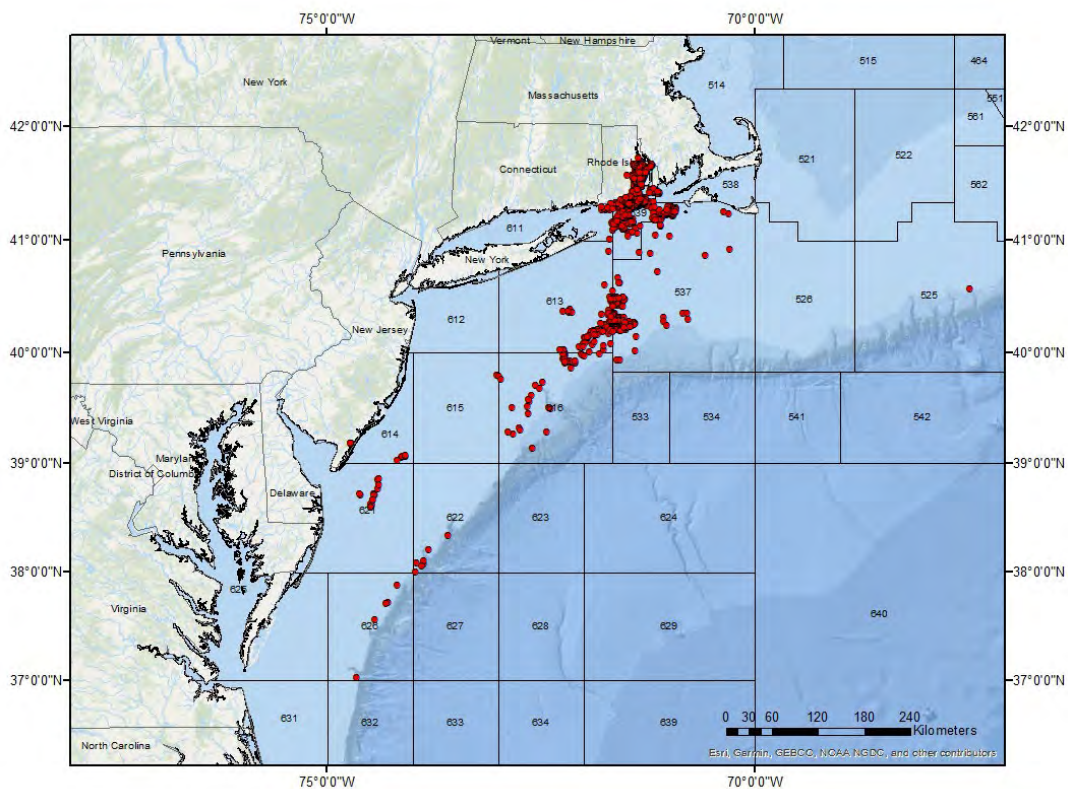


Figure 1. Black Sea Bass Research Fleet sampling locations (red dots) and associated statistical areas in the Southern New England and Mid-Atlantic region of the United States East Coast.

Table 2. Summary of data collected by the Black Sea Bass Research Fleet as of May 1, 2022.

Total Black Sea Bass Sampled	41,614
Percent Male	25%
Percent Female	39%
Percent Unknown	36%
Minimum Size (cm)	1
Maximum Size (cm)	68
Average Size (cm)	29.1
Percent Discarded	70%
Percent Retained	30%

In addition to the application of biological black sea bass data to the stock assessment, the data derived from the Black Sea Bass Research Fleet could also be used to characterize the catch, bycatch, and other characteristics of black sea bass in the SNE/MAB region, including gear selectivity and spatiotemporal patterns in catch composition. An additional 12 months of sampling by the Research Fleet will provide a better understanding of these seasonal and spatial dynamics as the data will now become the first multi-gear, multi-year, time series for the species.

The data collected during the previous funding years of the project exhibit interesting biological and fishery trends that will continue to be monitored in subsequent years of sampling for the proposed project. As expected, the average length of retained fish (39.1 cm) is larger than that of discarded fish (25.1 cm). However, the high frequency of legal-sized (>27.94 cm) discarded black sea bass caught by commercial gear suggests black sea bass are primarily being discarded due to seasonal closures and/or low daily limits, rather than the minimum size limit. For example, 44% of all commercially discarded fish have been legal size. The range of lengths of discarded fish further supports this, showing that even the largest of sampled black sea bass (receiving the highest market value) are often discarded (Figure 2).

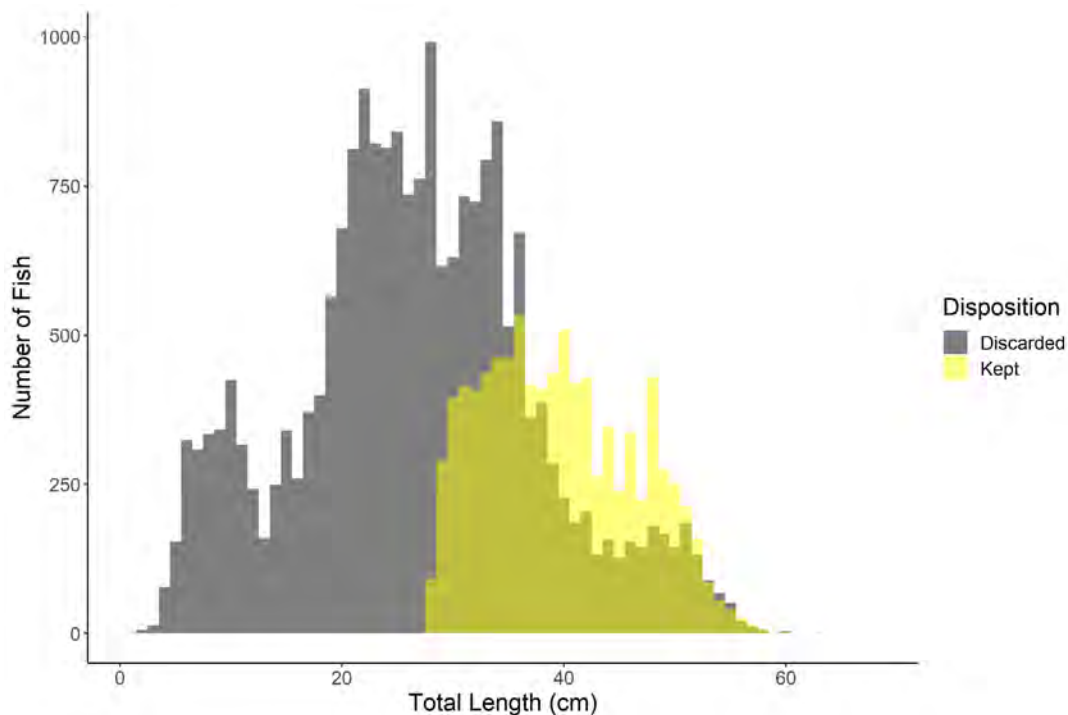


Figure 2. Size spectra of black sea bass sampled by the Research Fleet from November 30, 2016 to May 1, 2022.

When comparing gear selectivity between the different gear types represented within the Research Fleet, trends between discarded and retained black sea bass are apparent (Figures 3 and 4). Trawl gear regularly interacts with the largest size range of black sea bass of all the gear

types represented. Rod and reel (commercial and charter), fish pot, and lobster pot all exhibited nearly as wide a range of size interaction with black sea bass as trawl gear types, however, did not interact with the smallest of size classes of black sea bass as frequently and therefore had higher mean total length. Gillnet appears to be in a distinct grouping of its own and exhibits the highest selectivity amongst all represented target gear types, as this gear exclusively interacts with the largest size classes of black sea bass. Conch pot and oyster aquaculture are similarly selective compared to gillnet gear however interact primarily with the smallest size classes of black sea bass. Interestingly, black sea bass of legal size (>27.94 cm) are still sometimes captured in conch pots and have been retained for sale during sampling events.

These trends, which have become apparent from just the first several funding years of sampling, suggest there is gear-specific size selectivity occurring in the black sea bass fisheries in the SNE/MAB regions. The proposed project will continue to track these trends as the time series builds with subsequent years of sampling. This type of information could have important ramifications to the stock assessment as it could help inform the selection of fleets modeled within the assessment.

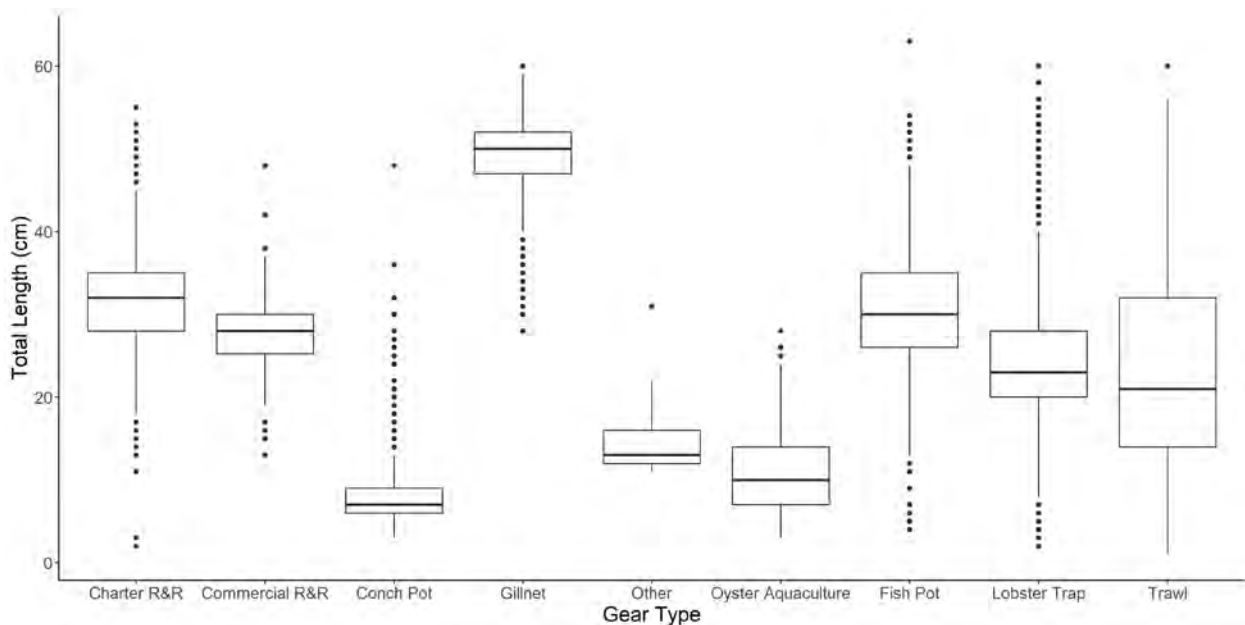


Figure 3. Size range of discarded black sea bass sampled by each gear type represented within the research fleet as of May 1, 2022.

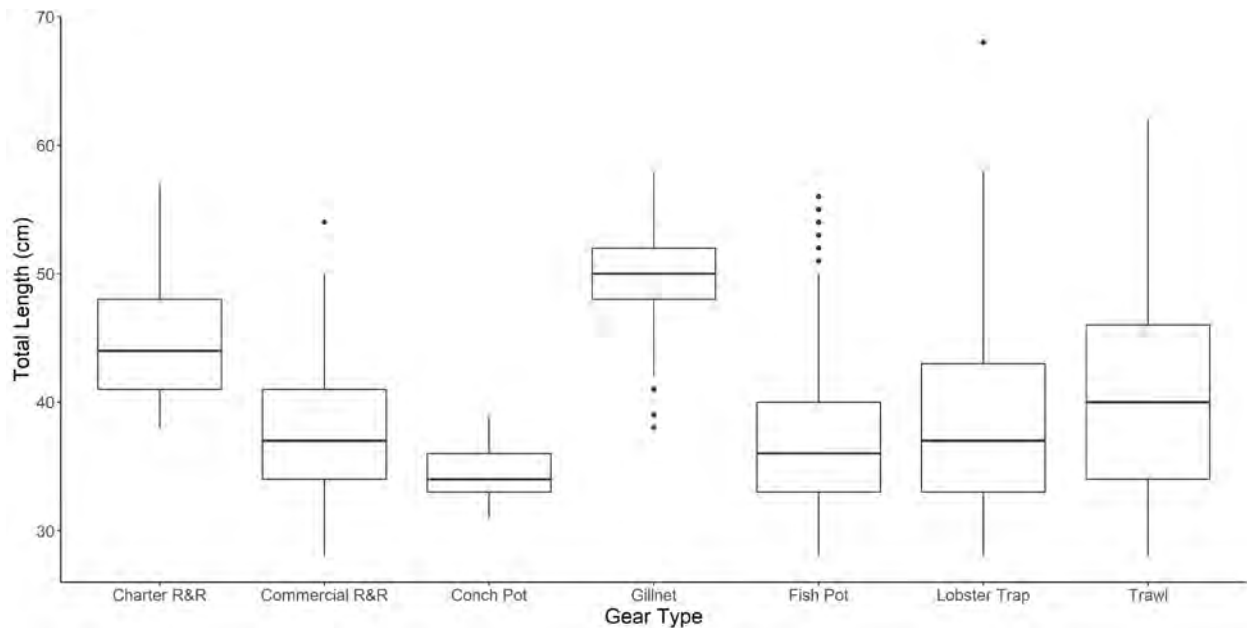


Figure 4. Size range of retained black sea bass sampled by each gear type represented within the research fleet as of May 1, 2022. Note, oyster aquaculture gear type is absent from this graph because no black sea bass have been retained from this gear type.

During the proposed year of the project, the project team will focus on the refinement and expansion of analyses previously established for application to the stock assessment including: size spectra, sex ratios, catch per unit effort (CPUE), black sea bass retention and discard structure, seasonal activity of Research Fleet, and gear selectivity. Specifically, internal data analysis questions proposed during the past funded year of the project were: 1) Are there spatial (latitudinal) patterns in the length frequency or sex ratio of black sea bass?, 2) Are there seasonal differences in black sea bass catch composition (length frequency and sex ratio)?, 3) Are different life stages of black sea bass apparent in commercial fisheries catch in specific areas or at different times of year?, and 4) What is the selectivity (min, max, mean length) of different gear types (trawl, fish pots, gillnet, lobster/crab pot, rod and reel) that harvest black sea bass? Year-7 analyses will build upon the initial results from exploration of these questions and will begin to explore temporal trends in the dataset. The project team will aim to publish a manuscript containing results from internal analyses in a peer-reviewed journal as time allows. The establishment of gear type selectivity curve models comparing different gear types as well as multiple years of Research Fleet data will serve as the potential direct input to the next black sea bass stock assessment.

The open-source statistical software package R will be used for data analysis. Length frequencies, black sea bass length gear selectivity, spatial and seasonal sex ratio regression models, and catch rate patterns will all be updated based on the protocols established in prior years of the project to further analyze seasonal trends as well as compare data from year to year. Data and code will be made available to others upon reasonable request.

In addition to further addressing the aforementioned research questions, the project team will also explore novel fishery dependent indices for the black sea bass stock assessment, as time permits. Building upon the analytical techniques established in prior years, data will continue to be standardized from the disparate gear types represented within the Research Fleet through generalized linear modeling approaches and/or hierarchical modeling techniques to allow for more direct communication into the black sea bass stock assessment.

Outreach and Education

Education, outreach, and ongoing communication are an integral part of the overall work plan for the proposed project. These components of the proposed project support the goal of fostering collaborative working partnerships among scientists, managers, and members of the fishing industry through all phases of research, from the fine-tuning of sampling strategies through the analysis and sharing of data and results.

The primary outreach/education goal of the proposed project is to share and disseminate information on two topics: 1) the lessons learned from the collaborative Research Fleet approach for fishery dependent data collection; and 2) the findings from analysis of the black sea bass catch, bycatch, and biological databases derived from this project.

A secondary goal is to share and disseminate project information to a variety of interest groups including: 1) commercial fishing industry members; 2) fisheries scientists and managers based in various state, regional, and federal agencies; 3) outside researchers who will utilize this information to inform their own research efforts in the region; and 4) other interested parties seeking information on new data collection/ocean monitoring techniques and approaches, and/or trends in black sea bass abundance and distribution in the SNE/MAB region.

There are several work elements embedded in the project work plan that are aimed at specifically addressing outreach and education goals, including:

1. Ongoing communication with project team members, including the members of the Black Sea Bass Research Fleet through personal meetings, group meetings, e-mail briefings, and phone conversations. Annual Research Fleet meetings have been held during previous years of funding, except for FY20 which was canceled due to the COVID-19 pandemic. During annual meetings, the CFRF hosts all Research Fleet members, PIs, project staff, and steering committee members to receive feedback on the data collection process and present trends and analyses of the past year's data. These Fleet meetings have been invaluable for receiving project feedback and as well as forming relationships between the fishing industry, managers, and scientists. The project team is currently planning a Fleet meeting for summer 2022, and additional annual meetings will be held for the proposed project if granted continued funding through FY23.
2. Periodic project briefings to key individuals outside the project team, including ASMFC, MAFMC, NMFS NEFSC, and NMFS GARFO staff, members of the black sea bass fishing fleet, and interested others through direct e-mail/mail correspondence, including

periodic newsletters describing the project progress. The CFRF newsletters are sent to over 1500 addresses.

3. Regular postings of project information on the CFRF website, including descriptions of the fishermen involved, the equipment being used, the type of data being collected, and findings, as this information becomes available over the course of the project (www.cfrfoundation.org/black-sea-bass-research-fleet). The CFRF also posts periodic updates on this project on the CFRF Facebook page, which has over 1500 followers.
4. Participation in scientific, public, and industry-based conferences. So far, these include:
 - a. 2017
 - i. Massachusetts Lobsterman’s Association (MLA) Annual Trade Show (Booth)
 - ii. New Bedford Working Waterfront Festival (Booth)
 - iii. Coastal and Estuarine Research Federation Conference (Booth)
 - b. 2018
 - i. Southern New England Chapter (SNEC) of the American Fisheries Society (AFS) (Poster presentation. *“Advancing Fishery Dependent Data Collection for Black Sea Bass (*Centropristis striata*) in the Southern New England and Mid-Atlantic Region using Modern Technology and a Fishing Vessel Fleet Approach”*. Thomas Heimann, Anna Malek Mercer, and Jason McNamee)
 - ii. MLA (Seminar)
 - iii. AFS (Presentation. *“Advancing Fishery Dependent Data Collection for Black Sea Bass (*Centropristis striata*) in the Southern New England and Mid-Atlantic Region using Modern Technology and a Fishing Vessel Fleet Approach”*. Anna Malek Mercer, Thomas Heimann, and Jason McNamee)
 - c. 2019
 - i. SNEC AFS (Presentation. *“Using Fishermen-Collected Data to Explore the Black Sea Bass (*Centropristis striata*) Population and Construct Gear-Specific Discard Characterizations”*. Anna Malek Mercer, Thomas Heimann, and Jason McNamee)
 - ii. MLA (Booth and Seminar)
 - iii. Maine Fishermen’s Forum (Booth and Presentation. *“Warming Waters, Emerging Species, and Market Changes: Lessons Learned from Southern New England”*. Anna Malek Mercer, Aubrey Ellertson, and Thomas Heimann)
 - iv. Wakefield Fisheries Symposium (Presentation. *“Using Industry Collaboration to Improve Black Sea Bass Management”*. Anna Malek Mercer, Thomas Heimann, and Jason McNamee)
 - v. Senator Sheldon Whitehouse’s 10th Annual Oceans, Energy, and Environmental Leaders Day (Poster Presentation. *“Advancing Fishery Dependent Data Collection for Black Sea Bass (*Centropristis striata*) in the Southern New England and Mid-Atlantic Region using Modern Technology*

- and a Fishing Vessel Fleet Approach*". Thomas Heimann, Anna Malek Mercer, and Jason McNamee)
- vi. Gulf of Maine 2050 symposium (Lightning Talk. "Warming Waters Create Opportunity for Diversification and Collaboration: Addressing the Rise of Black Sea Bass in Southern New England". Thomas Heimann, Christopher Glass, and Jason McNamee)
- d. 2020
 - i. New England Cooperative Research Summit. "Filling the Gap with Self-Reported Data: Research Fleets". N. David Bethoney and Fred Mattera
 - e. 2021
 - i. AFS (Two Presentations. 1. *"Using a fishery-dependent research fleet approach to characterize the composition of black sea bass (Centropristis striata) discards in the Southern New England and Mid-Atlantic fishery"*. Hannah Verkamp, Thomas Heimann, Jason McNamee, and David Bethoney. 2. *"The Commercial Fisheries Research Foundation Research Fleets: Progress and New Directions"*. N. David Bethoney, Aubrey Ellertson, and Thomas Heimann)
5. Sharing of relevant data and samples to aid other regional research initiatives centered on black sea bass. So far, this has included:
- a. Facilitated the collection of 30 live black sea bass for laboratory observation of black sea bass predation on lobster by a Master's student in Dr. Candace Oviatt's lab at University of Rhode Island
 - b. Contributed over 150 black sea bass samples to Dr. Jonathan Grabowski at Northeastern University since 2019 to investigate differences among black sea bass across three distinct geographic zones in the northern range of black sea bass.
 - c. Contributed 30 black sea bass samples to Dr. Kelton McMahon at the University of Rhode Island in 2019 to investigate stable isotope concentrations and trophic overlap with cod.
 - d. Contributed length, sex, disposition, date, time, and location data from recreational fishing trips by a Research Fleet member to Mr. Chris McGuire of the Nature Conservancy in 2019 to validate the organizations camera-based data collection system.
 - e. Contributed 100 black sea bass samples to Dr. Katie Lotterhos at Northeastern University in 2021 to sequence the black sea bass genome and evaluate population structure.
 - f. Contributed aging structures from over 2,400 black sea bass for inclusion in the Virginia Institute of Marine Science's black sea bass aging database.
 - g. Contributed 69 otoliths to scientists at Massachusetts Division of Marine Fisheries for inclusion in a study that validated ageing methods for black sea bass and compared results across different regions. This work was recently published: Koob ER, SP Elzey, JW Mandelman, MP Armstrong. 2021. "Age validation of the

northern stock of black sea bass (*Centropristis striata*) in the Atlantic Ocean. Fish Bull. 119: 261-271 DOI: 10.7755/FB.119.4.6

- h. Contributed relevant data to a Masters student at the University of Massachusetts Dartmouth School of Marine Science and Technology studying the effects of windfarm development on black sea bass.
6. Organization of a research session at the end of the project involving managers, scientists, and members of the commercial and recreational fishing industries to share project findings and discuss experiences and results.
7. Issuance and distribution of a written summary report.

Geographic Location:

At-sea sampling will be conducted within the northern Atlantic black sea bass stock area (SNE/MAB region), potentially including statistical areas 521 to 631. The final distribution of at-sea data collection will depend on the fishing locations selected by participant fishermen. Project administration, and data management and analyses will be conducted at the Commercial Fisheries Research Foundation office in Kingston, Rhode Island and the RI DEM marine laboratory in Jamestown, Rhode Island.

Milestone Schedule:

Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13-15
Research Fleet data collection and Fleet support	Research Fleet data collection and Fleet support	Research Fleet data collection and Fleet support	Research Fleet data collection and Fleet support	Research Fleet data collection and Fleet support	Research Fleet data collection and Fleet support	Research Fleet data collection and Fleet support	Research Fleet data collection and Fleet support	Research Fleet data collection and Fleet support	Research Fleet data collection and Fleet support	Research Fleet data collection and Fleet support	Research Fleet data collection and Fleet support	Final report writing and submission of report and all project data to ACCSP
				Apply for RI DEM Permits	Distribute RI DEM Permits to Fleet							
Maintain sampling gear and buy new sets	Maintain sampling gear	Maintain sampling gear	Maintain sampling gear	Maintain sampling gear	Maintain sampling gear	Maintain sampling gear	Maintain sampling gear	Maintain sampling gear	Maintain sampling gear	Maintain sampling gear	Maintain sampling gear & collect after sampling	
Maintain ODD, server, and database	Maintain ODD, server, and database	Maintain ODD, server, and database	Maintain ODD, server, and database	Maintain ODD, server, and database	Maintain ODD, server, and database	Maintain ODD, server, and database	Maintain ODD, server, and database	Maintain ODD, server, and database	Maintain ODD, server, and database	Maintain ODD, server, and database	Maintain ODD, server, and database	
Data QA/QC, review, and analysis	Data QA/QC, review, and analysis	Data QA/QC, review, and analysis	Data QA/QC, review, and analysis	Data QA/QC, review, and analysis	Data QA/QC, review, and analysis	Data QA/QC, review, and analysis	Data QA/QC, review, and analysis	Data QA/QC, review, and analysis	Data QA/QC, review, and analysis	Data QA/QC, review, and analysis	Data QA/QC, review, and analysis	
		Quarterly reports to Fleet Members			Quarterly reports to Fleet Members			Quarterly reports to Fleet Members			Quarterly reports to Fleet Members	
				Submit data to ACCSP		Write progress report and submit to ACCSP				Submit data to ACCSP		
Maintain project website and project outreach	Maintain project website and project outreach	Maintain project website and project outreach	Maintain project website and project outreach	Maintain project website and project outreach	Maintain project website and project outreach	Maintain project website and project outreach	Maintain project website and project outreach	Maintain project website and project outreach	Maintain project website and project outreach	Maintain project website and project outreach	Maintain project website and project outreach	

Project History Table:

<u>Funding Year</u>	<u>Title</u>	<u>Original Project Dates</u>	<u>Funded Amount</u>	<u>Total Project Cost</u>	<u>Description</u>
2016 New	Advancing Fishery Dependent Data Collection for Black Sea Bass (<i>Centropristis striata</i>) in the Southern New England and Mid-Atlantic Region Utilizing Modern Technology and a Fishing Vessel Research Fleet Approach	September 1, 2016 – August 31, 2018	\$137,827.00	\$203,072.00	Piloted the research fleet technique for collection of fishery dependent catch, effort, bycatch, and biological data in the multi-gear black sea bass fishery
2018 New	Advancing Fishery Dependent Data Collection for Black Sea Bass (<i>Centropristis striata</i>) in the Southern New England and Mid-Atlantic Region Utilizing Modern Technology and a Fishing Vessel Research Fleet Approach	May 1, 2018 – May 31, 2019	\$135,648.00	\$187,949.00	Maintained the research fleet fishery dependent data collection of catch, effort, bycatch, and biological data in black sea bass fishery and expanded Research Fleet by two fishing vessels
2019 Maintenance	Advancing Fishery Dependent Data Collection for Black Sea Bass (<i>Centropristis striata</i>) in the Southern New England and Mid-Atlantic Region Utilizing Modern Technology and a Fishing Vessel Research Fleet Approach	June 1, 2019 – May 31, 2020	\$132,749.00	\$169,033.00	Maintained the Research Fleet data collection of catch, effort, bycatch, and biological data in the black sea bass fishery in the SNE/MAB region and expanded the Research Fleet by two fishing vessels
2020 Maintenance	Advancing Fishery Dependent Data Collection for Black Sea Bass (<i>Centropristis striata</i>) in the Southern New England and Mid-Atlantic Region Utilizing Modern Technology and a Fishing Vessel Research Fleet Approach	August 1, 2020 – July 31, 2021	\$132,097.00	\$157,735.00	Maintained the Research Fleet data collection of catch, effort, bycatch, and biological data in the black sea bass fishery in the SNE/MAB region and expanded the Research Fleet by one fishing vessel
2021 Maintenance	Advancing Fishery Dependent Data Collection for Black Sea Bass (<i>Centropristis striata</i>) in the Southern New England and Mid-Atlantic Region Utilizing Modern Technology and a Fishing Vessel Research Fleet Approach	August 1, 2021 – July 31, 2022	\$132,064.00	\$154,537.00	Maintained the Research Fleet data collection of catch, effort, bycatch, and biological data in the black sea bass fishery in the SNE/MAB region and expanded the Research Fleet by two fishing vessels
2022 Maintenance	Advancing Fishery Dependent Data Collection for Black Sea Bass (<i>Centropristis striata</i>) in the Southern New England and Mid-Atlantic Region Utilizing Modern Technology and a Fishing Vessel Research Fleet Approach	August 1, 2022 – July 31, 2023	\$132,005.00	\$154,478.00	Will maintain the Research Fleet data collection of catch, effort, bycatch, and biological data in the black sea bass fishery in the SNE/MAB region

Project Accomplishments Measurement (Metrics and *Achieved Goals*):

Project Goal	Metric 1	Metric 2	Metric 3	Metric 4	Metric 5	Metric 6	Metric 7
Collection & communication of biological and fishery data for BSB	Upkeep of ODD, CFRF server, and MySQL database <i>Achieved in Years 1-5 + In progress Year 6</i>	Support of 14 Research Fleet Members <i>Achieved in Years 1-5 + In progress Year 6</i>	Twelve months of biological BSB and fishery data collection by Fleet <i>Achieved in Years 1-5 + In progress Year 6</i>	Collection of up to 27,000 BSB records, 540 record of catch/discards, and 540 session/effort data by Research Fleet <i>Achieved in Years 1-5 + In progress Year 6</i>	Transfer of collected data into MySQL database <i>Achieved in Years 1-5 + In progress Year 6</i>	Distribution of quarterly reports to Fleet Members <i>Achieved in Years 1-5 + In progress Year 6</i>	Submission of biological and fishery data to ACCSP and other managers <i>Achieved in Years 1-5 + In progress Year 6</i>
Reduce uncertainties in BSB stock assessment	Increase number of gear replicates in non-trawl fishery <i>Achieved in Years 2-4</i>	Provide BSB data from areas and times of year currently under sampled <i>Achieved in Years 1-5 + In progress Year 6</i>	Distribution of project data to managing stakeholders at federal, region, and local level <i>Achieved in Years 1-5 + In progress Year 6</i>	Utilization of data by BSB stock assessment working group <i>In progress</i>	Explore fishery dependent index of abundance for BSB using Fleet data <i>In progress</i>		
Assess spatial & temporal patterns in BSB fishery and catch	Analyze catch trends between years, gear types, and locations of Fleet sampling <i>Achieved in Years 1-5 + In progress Year 6</i>	Monitor discard structure between years within Fleet sampling <i>Achieved in Years 1-5 + In progress Year 6</i>	Monitor size and sex structure of retained BSB between sampling years <i>Achieved in Years 1-5 + In progress Year 6</i>	Monitor trends in length frequencies within gear types, locations and times of year <i>Achieved in Years 1-5 + In progress Year 6</i>	Add additional years of data to explore inter annual differences in length frequency <i>Achieved in Years 1-5 + In progress Year 6</i>	Update of BSB sex ratio logistic regression models from prior years <i>Achieved in Years 1-5 + In progress Year 6</i>	Develop manuscript for publication utilizing biological or fishery data from Fleet <i>In progress</i>
Demonstrate model approach for cost efficient fishery dependent data collection	Usage of collaborative approach established in previous years <i>Achieved in Years 1-5 + In progress Year 6</i>	Presentations of Fleet design at scientific conferences <i>Achieved in Years 1-5 + In progress Year 6</i>	Develop manuscript to validate Fleet design through peer review <i>In progress</i>				

Cost Summary and Funding Transition Plan:

This proposal represents a one third cost reduction from Year 6's proposal of a similar scope to comply with the ACCSP funding schedule. The drop is due primarily to a reduction in CFRF personnel costs. As the staff have become more experienced in running the Research Fleet, their efficiency has increased allowing the reduction of research staff time from 50% to 35% and business manager time from 7.5% to 2.5% on the project. Additionally, less supervision and support from the Executive Director is needed due to staff experience. This is reflected in Mr. Heimann's role as a principal investigator and the decrease in Executive Director time from 10% to 2.5%. Further, the Black Sea Bass Research Fleet sampling rate was dropped from 55% to 45% based on reporting rates from the last two years. Though this is influenced by the COVID-19 pandemic, the amount of data produced from this sampling rate is adequate to meet project objectives. Reductions to the travel, programmer and supply budgets were also made. These changes are reflected in the CFRF sub-contract (section F of the Budget Table).

The CFRF and RI DEM have pursued funding from a variety of sources for the Black Sea Bass Research Fleet and will continue to do so to ensure the longevity and utility of the data collected to the management of this data poor species. In previous funding years, the CFRF has been successful in securing partial funding from the Sarah K. de Coizart Tenth Perpetual Charitable Trust to support the Research Fleet. Further, the CFRF has been successful in the past, most recently in regard to the other collaborative Research Fleet for Lobster and Jonah crab, in securing congressional funding directly for the project. These recently awarded funds represent a willingness for the CFRF and RI DEM to search for external sources of funds to support the Research Fleet as well as an agreement by the management representatives on the steering committee and the industry collaborators that the project addresses important issues. The Senate Appropriations Committee recently announced the return of Congressionally Directed Spending which will allow for Rhode Island Senators to potentially fund Rhode Island focused projects. This fiscal year a Congressionally Directed Spending request to broadly support collaborative research initiatives occurring at CFRF was made by the office of Senator Jack Reed. The Black Sea Bass Research Fleet falls under this scope and this could be a source of transition funding as ACCSP contributions decline. The CFRF and RI DEM will continue to look for outside, continued, sources of funding to support the Research Fleet and the valuable work it produces into the future.

Budget Table:

TOTAL	Year 7 (Maintenance Year 5)		
	Proposal	In-Kind	Total
	\$ 88,152	\$ 21,488	\$ 109,640
% Contribution by Funding Source	80%	20%	100%
Object Class Category	Proposal	In-Kind	Total
A Personnel			
- RI DEM - Jason McNamee		\$ 5,347	\$ 5,347
- RI DEM - Contractor		\$ 4,547	\$ 4,547
- RI Dem - Intern		\$ 2,500	\$ 2,500
Total RI DEM Personnel Costs	\$ -	\$ 12,394	\$ 12,394
B Fringe Benefits	\$ -	\$ 4,214	\$ 4,214
C Travel	\$ -	\$ -	\$ -
D Equipment	\$ -	\$ -	\$ -
E Supplies	\$ -	\$ -	\$ -
F Contractual - CFRF			
a. Personnel			
- Executive Director - David Bethoney	\$ 3,176		\$ 3,176
- Research Biologists	\$ 20,108		\$ 20,108
- Business Manager	\$ 1,259		\$ 1,259
Total CFRF Personnel Costs	\$ 24,543	\$ -	\$ 24,543
b. Fringe Benefits	\$ 2,455	\$ -	\$ 2,455
c. Travel	\$ 500	\$ -	\$ 500
d. Equipment	\$ -	\$ -	\$ -
e. Supplies			
- Research Supplies	\$ 500		\$ 500
- Office Supplies	\$ 650		\$ 650
Total Supplies	\$ 1,150	\$ -	\$ 1,150
f. Contractual			
- Programmer for On-Deck Data database	\$ 250	\$ -	\$ 250
Total Contractual	\$ 250	\$ -	\$ 250
g. Construction	\$ -	\$ -	\$ -
h. Other Costs			
- Fishing Vessel Stipends	\$ 45,360	\$ -	\$ 45,360
- Executive Assistance	\$ -	\$ 1,500	\$ 1,500
Total Other Costs	\$ 45,360	\$ 1,500	\$ 46,860
i. Total Direct Charges	\$ 74,258	\$ 1,500	\$ 75,758
j. Indirect Charges			
- Proposed at 18.71% of CFRF Direct Charges	\$ 13,894	\$ 281	\$ 14,175
Total Indirect Charges	\$ 13,894	\$ 281	\$ 14,175
k. Total CFRF Costs	\$ 88,152	\$ 1,781	\$ 89,933
G Construction	\$ -	\$ -	\$ -
H Other Costs	\$ -	\$ -	\$ -
I Total Direct Costs	\$ 88,152	\$ 18,389	\$ 106,541
J Indirect Charges	\$ -	\$ 3,099	\$ 3,099
K Total Proposal Costs	\$ 88,152	\$ 21,488	\$ 109,640

Rhode Island Department of Environmental Management & Commercial Fisheries Research Foundation
 ACCSP Funding Proposal (Maintenance Project – Project Year 7, Maintenance Year 5): Fishery Dependent Sampling for Black Sea Bass
 (*Centropristis striata*)

Proposal components that address the ranking criteria are underlined and a summary is provided on pages 30-33.

Budget Justification – Year 7 (Maintenance Year 5 Project, Proposed):

The total proposed federal budget requested by the Rhode Island Department of Environmental Management (RI DEM) and the Commercial Fisheries Research Foundation (CFRF) for all components of the work is \$88,152 for 12 months. The voluntary non-federal match funds provided by the RI DEM and CFRF is \$21,488. The total proposal value is \$109,640. The proposed timeframe is August 1, 2023 to July 31, 2024.

The proposed budget justification for object class category items includes the following:

- A. Personnel: \$12,394 In-Kind (RI DEM). RI DEM staff will play an advisory/support role in the proposed project, providing guidance on research protocols, assisting with statistical analyses as needed, exploring gear-specific indices of abundance and alternative modeling approaches as time permits, support in the procurement and storage of samples, and communicating project results to fishery governance system via existing participation in technical committees and working groups.

- B. Fringe Benefits: \$4,214 In-Kind (RI DEM). Fringe costs are charged on RI DEM FTEs only.
RIDEM Annual Fringe benefit rates are:

Retirement 24%	Deferred Compensation 0.4%
FICA 6.2%	Medicare 1.45%
Health care \$21,937/year	Dental \$1,132/year
Vision Mercer \$165/year	Assessed Fringe 4.25%
Retiree Health 6.75%	

- C. Travel: There are no direct travel charges.

- D. Equipment: There are no direct equipment charges.

- E. Supplies: There are no direct supplies charges.

- F. Contractual: The CFRF will conduct most of the work involved in this project, with administrative and technical assistance provided by RI DEM as In-Kind. These services will be charged to the grant as contractual costs and are outlined below to provide more detail as to how the funding will be used:
 - a) Personnel: \$24,543 federal. This includes the wages for the following CFRF personnel for time spent working directly on the project:
 - 1. Executive Director – Proposed at 2.5% of time for 12 months = \$3,176.
D. Bethoney, CFRF Executive Director, will oversee the administration, team communication/coordination, and outreach aspects of the project. He will also assist with data analysis, report and outreach material development, and communication of project progress to the client, fishing industry and management communities.

2. Research Scientist – Proposed at 35% of time for 12 months = \$20,108.
T. Heimann and another CFRF Research Biologists will be the primary individuals responsible for fleet organization, maintenance, and support, as well as data management, communication, and analysis. They will also support the Executive Director in project oversight tasks.
 3. Business Manager – Proposed at 2.5% of time for 12 months = \$1,259.
T. Winneg, CFRF Business Manager, will carry out all the finance related aspects of the project including research budget tracking, invoice processing, and administrative support tasks, including purchasing supplies.
- b) Fringe Benefits: \$2,455 federal. This includes a percentage for payroll taxes and worker’s compensation insurance prorated in accordance with % of salary paid from program. Benefits proposed at 10% of personnel costs based on 2021 benefits and historical analysis.
 - c) Travel: \$500 federal. Travel costs include travel support (mileage) for project staff to provide support at docks to Research Fleet participants, to participate in meetings with the Research Fleet, stock assessment scientists, and managers. The advent of remote participation may allow for dissemination of project methods, findings, and conclusions at an industry/professional conference.
 - d) Equipment: \$0. There will be no equipment costs on this project.
 - e) Supplies: \$1,150 federal. This category includes research supplies and project office supplies.
 1. Research Supplies: \$500 - Costs of tablets, waterproof cases, stylus & fish measuring board. Proposed at \$500 per set x 1 vessels for the duration of the project. The set of sampling equipment for existing Research Fleet vessels are replacements for equipment that is damaged or lost.
 2. Office Supplies: \$650 – Costs to cover database storage and website fees (\$50/month), project office and meeting supplies, etc.
 - f) Contractual: \$250 federal. This includes costs associated with:
 1. Programmer (\$250 - federal) - CFRF hires an outside computer programmer to maintain the OnDeckData application and database coding for data relay and storage, to address any issues that arise, and to update the app to maintain functionality.
 - g) Construction: There are no construction costs.
 - h) Other Costs: \$45,360 federal + \$1,500 match = \$46,860. This includes:
 1. Fishing vessel stipends (\$45,360 - federal) for 14 vessels for 12 months at \$600 per month. A fleet of 14 vessels will be utilized each month to obtain the proposed

biological samples. The total stipend is computed at 45% due to fluctuations in vessel sampling associated with weather, vessel maintenance, and seasonal black sea bass distribution.

2. Executive Assistance (\$1,500 - in-kind match) covers the administration assistance for the project (including, review of fleet applications and invoices) by the CFRF President and Vice President, who provide these services at no cost. Costs proposed at \$250 per day for 3 days for 2 people over the duration of the project.

i) Total Direct Charges: \$74,258 federal + \$1,500 in-kind = \$75,758 total. This is the total direct charges for cost items a-h.

j) Indirect Charges: \$13,894 federal + \$281 in-kind = \$14,175 total. Indirect general and administrative costs are calculated as 18.71% of Total Direct Charges. Indirect general and administrative costs are used to cover costs associated with the general operations of the CFRF including accounting services, legal services, maintenance of office space, liability insurance, payroll fees, phone/fax lines, internet service, etc. The CFRF's FY2022 Indirect Cost Rate Authorization Letter dated 2/11/22 is for 18.71% based on FY2021 actual costs.

k) Total Proposal Costs: \$88,152 Federal + \$1,781 In-Kind = \$89,933 Total.

G. Construction. There are no construction costs on this grant

H. Other Costs. There are no other costs associated with this grant.

I. Total Direct Charges: \$88,152 Federal + \$21,254 In-Kind = \$109,406 total. This is the total direct charges for cost items A-H.

J. Indirect Charges: \$3,099 In-Kind (RIDEM). Indirect charges are charged on RIDEM Salaries only. The Negotiated Indirect Cost Rate for FY2017 is 25%. (Total personnel is \$12,394 x 25% = \$3,099.)

K. Total Proposal Costs: \$88,152 Federal + \$21,488 In-Kind = \$109,640 Total.

Previous Year's Budget Narrative – Year 6 (Maintenance Year 4 Project, Funded FY22):

The total proposed federal budget requested by the Rhode Island Department of Environmental Management (RI DEM) and the Commercial Fisheries Research Foundation (CFRF) for all components of the work is \$132,005 for 12 months. The voluntary non-federal match funds provided by the RI DEM and CFRF is \$22,473. The total proposal value is \$154,478. The proposed timeframe is August 1, 2022 to July 31, 2023.

The proposed budget justification for object class category items includes the following:

L. Personnel: \$12,394 In-Kind (RI DEM). RI DEM staff will play an advisory/support role in the proposed project, providing guidance on research protocols, assisting with statistical analyses as needed, exploring gear-specific indices of abundance and alternative modeling approaches as time permits, support in the procurement and storage of samples, and communicating project results to fishery governance system via existing participation in technical committees and working groups.

M. Fringe Benefits: \$4,214 In-Kind (RI DEM). Fringe costs are charged on RI DEM FTEs only.

RIDEM Annual Fringe benefit rates are:

Retirement 24%	Deferred Compensation 0.4%
FICA 6.2%	Medicare 1.45%
Health care \$21,937/year	Dental \$1,132/year
Vision Mercer \$165/year	Assessed Fringe 4.25%
Retiree Health 6.75%	

N. Travel: There are no direct travel charges.

O. Equipment: There are no direct equipment charges.

P. Supplies: There are no direct supplies charges.

Q. Contractual: The CFRF will conduct most of the work involved in this project, with administrative and technical assistance provided by RI DEM as In-Kind. These services will be charged to the grant as contractual costs and are outlined below to provide more detail as to how the funding will be used:

l) Personnel: \$44,096 federal. This includes the wages for the following CFRF personnel for time spent working directly on the project:

1. Executive Director – Proposed at 10% of time for 12 months = \$12,100.

D. Bethoney, CFRF Executive Director, will oversee the administration, team communication/coordination, and outreach aspects of the project. He will also assist with data analysis, report and outreach material development, and communication of project progress to the client, fishing industry and management communities.

2. Research Scientist – Proposed at 50% of time for 12 months = \$28,392.

T. Heimann and another CFRF Research Scientist will be the primary individuals responsible for fleet organization, maintenance, and support, as well as data management, communication, and analysis.

3. Business Manager – Proposed at 7.5% of time for 12 months = \$3,604.

T. Winneg, CFRF Business Manager, will carry out all the finance related aspects of the project including research budget tracking, invoice processing, and administrative support tasks, including purchasing supplies.

- m) Fringe Benefits: \$3,969 federal. This includes a percentage for payroll taxes and worker's compensation insurance prorated in accordance with % of salary paid from program. Benefits proposed at 9% of personnel costs based on 2020 benefits and historical analysis.
- n) Travel: \$3,000 federal. Travel costs include travel support (mileage) for project staff to provide support at docks to Research Fleet participants, to participate in meetings with the Research Fleet, stock assessment scientists, and managers, and to participate in one industry/professional conference for two personnel to share and disseminate project methods, findings, and conclusions.
- o) Equipment: \$0. There will be no equipment costs on this project.
- p) Supplies: \$2,000 federal. This category includes research supplies and project office supplies.
 - 1. Research Supplies: \$1,000 - Costs of tablets, waterproof cases, stylus & fish measuring board. Proposed at \$500 per set x 2 vessels for the duration of the project. The two sets of sampling equipment for existing Research Fleet vessels are replacements for equipment that is damaged or lost.
 - 2. Office Supplies: \$1,000 - Costs to cover database storage and website fees (\$50/month), project office and meeting supplies, etc.
- q) Contractual: \$1,500 federal. This includes costs associated with:
 - 1. Programmer (\$1,500 - federal) - CFRF hiring an outside computer programmer to maintain the OnDeckData application and database coding for data relay and storage, to address any issues that arise, and to update the app to maintain functionality.
- r) Construction: There are no construction costs.
- s) Other Costs: \$55,440 federal + \$2,500 match = \$57,940. This includes:
 - 1. Fishing vessel stipends (\$55,440 - federal) for 14 vessels for 12 months at \$600 per month. A fleet of 14 vessels will be utilized each month to obtain the proposed biological samples. The total stipend is computed at 55% due to fluctuations in vessel sampling associated with weather, vessel maintenance, and seasonal black sea bass distribution.
 - 2. Executive Assistance (\$2,500 - in-kind match) covers the administration assistance for the project (including, review of fleet applications and invoices, work agreements, progress/final reports) by the CFRF President and Vice President, who provide these services at no cost. Costs proposed at \$250 per day for 5 days for 2 people over the duration of the project.

- t) Total Direct Charges: \$110,005 federal + \$2,500 in-kind = \$112,505 total. This is the total direct charges for cost items a-h.
 - u) Indirect Charges: \$22,000 federal + \$500 in-kind = \$22,500 total. Indirect general and administrative costs are calculated as 20.0% of Total Direct Charges. Indirect general and administrative costs are used to cover costs associated with the general operations of the CFRF including accounting services, legal services, maintenance of office space, liability insurance, payroll fees, phone/fax lines, internet service, board member participation, etc. The CFRF's FY2021 Indirect Cost Rate Authorization Letter dated 1/22/21 is for 22.0% based on FY2020 actual costs.
 - v) Total Proposal Costs: \$132,005 Federal + \$3,000 In-Kind = \$135,005 Total.
- R. Construction. There are no construction costs on this grant
- S. Other Costs. There are no other costs associated with this grant.
- T. Total Direct Charges: \$132,005 Federal + \$19,608 In-Kind = \$151,613 total. This is the total direct charges for cost items A-H.
- U. Indirect Charges: \$3,099 In-Kind (RIDEM). Indirect charges are charged on RIDEM Salaries only. The Negotiated Indirect Cost Rate for FY2017 is 25%. (Total personnel is \$12,394 x 25% = \$3,099.)
- V. Total Proposal Costs: \$132,005 Federal + \$22,473 In-Kind = \$154,478 Total.

Summary of Proposal for Ranking Purposes

Type: Maintenance

Primary Program Priorities:

This project follows fishery-dependent sampling protocols to collect black sea bass catch and effort, biological, and bycatch data from the SNE/MAB region. The percentage of project effort devoted to each of these modules is as follows: 50% Biological, 25% Catch and Effort, 25% Bycatch. Thus, Biological sampling is the primary program priority. The estimated project effort devoted to biological sampling reflects the collection of black sea bass length and sex data by participant vessels during three trips per month for twelve months (up to 504 trips and 25,200 black sea bass total).

Data Delivery Plan:

All biosamples data collected from this project to date has been bi-annually submitted to and accepted by the ACCSP biosamples database. With additional funding for the proposed project, the project team will continue to work closely with ACCSP to ensure data is in the correct format to be incorporated into the ACCSP biosamples database. Data will continue to be submitted bi-annually in June and December of the proposed project period.

Project Quality Factors

Multi-Partner/Regional impact including broad applications:

The results of the proposed project have regional impacts and broad applications, as black sea bass are expanding to inhabit, and potentially be harvested from, the majority of the US east coast. Furthermore, the social and economic implications of this work could be extensive, as project data contributes to the improvement of the northern Atlantic black sea bass stock assessment and potentially the creation of new economic opportunities. From a collaboration perspective, this project provides a unique opportunity for the RI DEM and CFRF to maintain a fisherman-based research fleet to address ACCSP priorities, drawing upon networks of partners in industry, fisheries research, and management. This project will help RI DEM and CFRF demonstrate that, with support from ACCSP, they have the ability to bring stakeholders together, outside of a contentious management environment, to collect, communicate, and analyze critically needed data to address the data needs of the data poor northern Atlantic black sea bass.

Greater than year 2 contains funding transition plan and justification for continuance:

This proposal is for a one-year study to continue an industry-based research fleet approach to biological, catch, and bycatch sampling for northern Atlantic black sea bass. The project has been successful through the first four years of funded work and has sampled over 41,000 black sea bass. An additional year of funding would bolster the first year-round, multi-year database

for this biologically data poor species. Ultimately, long term maintenance of this project will provide invaluable data to the ACCSP, ASMFC, and MAFMC, and improve the assessment and management of the northern Atlantic black sea bass resource. The CFRF and RI DEM have continued to apply for funding for this project through external sources and have secured supplemental funding to partially support the Research Fleet as described above. Obtaining long-term funding for the Research Fleet is a top and ongoing priority for project PIs and staff.

In-kind contribution: The total project cost is \$109,640. In-kind contributions provided by RI DEM and CFRF total \$21,488. Thus, RI DEM and CFRF will provide 20% of total project costs.

Improvement in data quality/quantity/timeliness:

The proposed project addresses the critical need to improve the quality, quantity, and timeliness of biological, catch and effort, and bycatch data for the northern Atlantic black sea bass, which the ACCSP Biological Review Panel identified as having inadequate biological sampling and high stakeholder priority, resulting in the highest-ranking priority score. Ultimately, the proposed project will help to meet ACCSP's mission of improving data quality for fisheries science by contributing to a single data management system that will meet the needs of fishery managers, scientists, and fishermen.

Potential secondary modules as by-products:

The potential secondary modules are catch and effort (25%) and bycatch sampling (25%). The project effort allocated to the catch and effort module refer to the sampling that occurs while the fishery is open. Although the fishery is open for a large portion of the year, black sea bass is often caught and retained as a non-target species. The project effort allocated to the bycatch module reflects sampling efforts conducted while the commercial black sea bass fishing season is closed and while participant vessels are targeting other species but still interacting with black sea bass as bycatch.

Impact on stock assessment:

The northern Atlantic black sea bass stock assessment new model requires spatially and temporally comprehensive data that is currently lacking. Thus, the proposed project aims to provide critically needed biological data from retained and discarded black sea bass, and fishery data from a variety of gear types to continue to evolve and improve the black sea bass stock assessment. The project team will also explore novel fishery dependent indices for the black sea bass stock assessment, as time permits.

The Research Fleet collected data has the potential to directly improve the federal stock assessment in a number of ways including reducing the uncertainty gear type specific selectivity, and gear (and location) specific discard and catch characterizations. Currently, the indices of abundance relied upon in the black sea bass stock assessment come primarily from the NEFSC winter and spring trawl survey, Northeast Area Monitoring and Assessment Program (NEAMAP) survey trawls, recreational catch per effort, and is supplemented with various state

trawl survey indices of abundance (NEFSC 2017). The utility of the Research Fleet data in this respect is to inform the management about catch and discard structure from a variety of gear types. Whereas the stock assessment currently only delineates between trawl and non-trawl gear types, after building a multiple-year time-series the Research Fleet data could potentially be utilized to create a variety of CPUE indices of abundance (trawl, gillnet, lobster pot, rod & reel, fish pot, and multigear). Further, the Research Fleet data has the potential to be directly used to create a discard characterization for the northern stock sub-unit and reduce uncertainties in the annual total fishery removals.

Innovative:

The innovative and cost-effective nature of the proposed project, which relies upon collaboration between a Program partner and the fishing industry, can provide an opportunity for fishermen to constructively engage in the data collection process for black sea bass and provide a model for future data collection efforts in other regions and fisheries. In addition to demonstrating a novel sampling approach, the proposed project also leverages modern technology to improve the efficiency of data collection and communication.

Properly Prepared:

This proposal follows the guidelines provided in the ACCSP Funding Decision Document.

Principal Investigators:

The co-Principal Investigators of the proposed project are: Jason McNamee (Chief, RI DEM Marine Fisheries), David Bethoney (Executive Director, CFRF), and Thomas Heimann (Research Biologist, CFRF). Curriculum vitae are provided in the following pages.

Jason McNamee will play an advisory/support role in this project, given his existing commitments at the RI DEM Division of Marine Fisheries. More specifically, Jason will provide advice for sampling protocols, act as a liaison to the existing black sea bass assessment/management infrastructure and assist with data analysis as his time permits (data review/analysis will primarily be the role of the CFRF Research Biologist). In his role as both a technical committee member, and as a member of the black sea bass Research Track Stock Assessment Working Group, Jason McNamee will be able to help the project with capturing the correct information and making sure this information is formatted appropriately for inclusion in future northern Atlantic black sea bass stock assessments.

Dr. N. David Bethoney, Executive Director of the CFRF, will serve as the lead Co-PI for the proposed project. Dr. Bethoney will be responsible for overall projection direction and progress towards completing proposed objectives. Dr. Bethoney will be primarily responsible for overseeing proposed data analysis as well as dissemination of project results to the MAFMC and ASMFC. He will also assist in at-sea related research on an as-needed basis.

Thomas Heimann, CFRF, will serve in an advisory/support role working with the CFRF Research Biologist responsible for Research Fleet maintenance and support, as well as data management,

communication, and analysis. Heimann was the primary researcher for the Black Sea Bass Research Fleet since its first year of funding starting in September 2016. Heimann has gained extensive experience with the work involved in initiating and supporting an industry-based research fleet and has formed a relationship with the current Fleet Members.

Jason Earl McNamee, PhD
519 Congdon Hill Rd
Saunderstown, RI 02874
Day Phone: 401-423-1943
Email: jason.mcnamee@dem.ri.gov

WORK EXPERIENCE

RI Department of Environmental Management 12/2002 - Present
Jamestown, RI US

Chief, Marine Resource Management

Duties:

- Management of the Marine Fisheries program for the RI Dept. of Environmental Management
- Management of a staff of 20 professionals in the field of marine fisheries
- Manage operating budgets for multiple federal grants and state accounts
- Creation of grant proposals for marine fisheries projects
- Management of the Ft Wetherill Marine Laboratory building and research vessels
- Membership on several technical panels: the New England Council Science and Statistics Committee (Chair), Atlantic States Marine Fisheries Commission Menhaden (chair), Tautog (chair), and Summer Flounder/Scup/Black Sea Bass technical and stock assessment committees, Biological and Ecological Reference Point committee
- Support to the RI Marine Fisheries Council
- Creation and administration of the RI Marine Fisheries Institute
- Principal investigator (PI) on the Narragansett Bay juvenile seine survey
- PI for the Narragansett Bay Menhaden monitoring program
- Small vessel operation
- Production and review of multiple annual technical and grant completion reports
- Perform stock assessment analyses

Skills developed: Personnel and budget management experience; Supervisory experience; Good statistical and computer skills (ADMB, R, Microsoft software, ADAPT, JMP, ASAP, Oracle Discoverer, web design); Species identification experience; Experience using water quality instrumentation (DO meter, pH meter, Gas Chromatograph, Conductivity meter, flow meter); GIS Experience (Arcview and R); Field work experience; Experience in the construction and maintenance of technical research equipment; Seine, fyke net, trawl net, gillnet, fish pot, and electroshock surveying; Small boat handling (State of Rhode Island and Coast Guard certified)

Supervisor's Name: Janet Coit

Supervisor's Phone: 401-222-4700 ext. 2409

RI Department of Environmental Management 4/2000 - 12/2002
Providence US

Senior Natural Resource Specialist

Duties: My duties were to perform all tasks necessary to conduct and complete a Total Maximum Daily Load reports including field work, data collection and processing, and writing of the report. I also participated with other staff to help in the completion of their reports.

Skills developed: Good statistical and computer background (Microsoft software), Experience designing and implementing a personal research project, Experience preparing a federally approved Quality Assurance Protection Plan, Experience using water quality instrumentation (DO meter, pH meter, Conductivity meter), Experience in the collection of water samples for testing (biological and metals), GIS Experience (Arcview) Field work experience, Small boat handling (State of Rhode Island and Coast Guard certified), Experience in the preparation of a federally approved Total Maximum Daily Load report, Experience disseminating information to the public

Supervisor's Name: Christian Turner

Supervisor's Phone: unsure, no longer employed at RIDEM

EDUCATION

University of Rhode Island – Graduate School of Oceanography

Narragansett, RI US

PhD – 8/2018

Major: Biological Oceanography

Doctoral Dissertation Topic: Multispecies Statistical Catch-At-Age Model for a Mid Atlantic Species Complex

University of Connecticut

Groton, CT US

Masters of Science Degree - 6/2006

38 Semester Hours

Major: Biological Oceanography

University of Rhode Island

Kingston, RI US

Bachelor's Degree - 5/1996

136 Semester Hours

Major: Zoology

PROFESSIONAL PUBLICATIONS

- ASMFC Lobster stock assessment (2015), ASMFC Menhaden stock assessment (2004, 2012, 2015), ASMFC Tautog stock assessment (2006, 2011, 2015), NEFSC Summer flounder stock assessment (2011, 2013), NEFSC Scup stock assessment (2011, 2015), NEFSC Black sea bass stock assessment (2004, 2016), Interactions between the introduced Asian shore crab, *Hemigrapsus sanguineus*, and three common rocky intertidal littorine gastropods in Southern New England (MS Thesis).
- Taylor, DL, J McNamee, J Lake, CL Gervasi , and DG Palance. 2016. Juvenile winter flounder (*Pseudopleuronectes americanus*) and summer flounder (*Paralichthys dentatus*) utilization of Southern New England nurseries: Comparisons among estuarine, tidal river, and coastal lagoon shallow-water habitats. *Estuaries and Coasts*. 39:1505-1525.

Dr. NAIFF DAVID BETHONEY
Executive Director
Commercial Fisheries Research Foundation
P.O. Box 278
Saunderstown, RI
401-515-4662, dbethoney@cfrfoundation.org

EDUCATION:

University of Massachusetts at Dartmouth School for Marine Science and Technology

PhD Dissertation: Understanding and avoiding River herring and American shad bycatch in the Atlantic herring and mackerel mid-water trawl fisheries.

Cum. GPA: 3.92 PhD Received 2013

MA Thesis: Association between diet and epizootic shell disease in the American lobster (*Homarus americanus*) around Martha's Vineyard

Cum. GPA: 3.93 M.S. Received 2010

Colby College - Waterville, ME

Major: Biology with Concentration in Environmental Science

Cum. GPA: 3.41, Cum Laude B.A. Received 2008

SEA Education Association of Woods Hole, MA

Study Abroad: Fall 2006

Documenting Change in the Caribbean: Designed and implemented an original biological research project with practical application while at sea. Studied at Woods Hole, and sailed from St. Croix, USVI to Key West, Florida with research stops at Montserrat, Dominican Republic, and Jamaica.

RECENT WORK EXPERIENCE:

- Commercial Fisheries Research Foundation Spring 2020-Present

Executive Director: Responsible for overseeing foundation business manager, scientific staff, interns, and consultants to carry out all tasks associated with ongoing projects and general administration. In addition, responsible for pursuing new partnerships and projects, including proposal development and submission, under the advisement of the foundation Board of Directors.

- UMASS-Dartmouth School for Marine Science and Technology Fall 2008-Spring 2020

Research Assistant Professor, Fall 2014-Spring 2020: All responsibilities of research associate position related to drop camera and herring work with the ability to be lead principle investigator on research proposals and serve on student committees. Served on the New England Fishery Management Council's Scallop Plan development team from March 2017-April 2020

Research Associate, Summer 2013-Summer 2014: All responsibilities of research assistant position described below with management and development responsibilities for scallop drop camera and groundfish video surveys. Management responsibilities include equipment purchasing and maintenance and oversight of all technical operations and student involvement.

Research Assistant, Summer 2010- Spring 2013: Major responsibilities included coordinating River Herring bycatch avoidance program, assisting the Massachusetts Division of Marine Fisheries port side sampling program, and scallop drop camera survey at-sea data collection and analysis.

JOURNAL PUBLICATIONS IN LAST 3 YEARS:

1. Chen C, Zhao L, Gallager S, Ji R, He P, Davis C, Beardsley RC, Hart D, Gentleman WC, Wang L, Li S, Lin H, Stokesbury KDE, Bethoney ND. Impact of larval behaviors on dispersal and connectivity of sea scallop larvae over the northeast U.S. shelf. Progress in Oceanography. 2021 May 11; 195. DOI: 102604
2. Harper DL, Bethoney ND, Stokesbury KDE, Lundy M, McLean MF, Stokesbury MJW. 2020. Standard Methods for the Collection of Morphometric Data for the Commercially Fished Sea Cucumber *Cucumaria frondosa* in Eastern Canada. Journal of Shellfish Research 39(2):481-489
3. Bethoney, ND. 2020. Investigating uncertainties created by camera improvement in an optical survey. Limnology and Oceanography: Methods. doi: 10.1002/lom3.10365

Rhode Island Department of Environmental Management & Commercial Fisheries Research Foundation

ACCSP Funding Proposal (Maintenance Project – Project Year 7, Maintenance Year 5): Fishery Dependent Sampling for Black Sea Bass (*Centropristis striata*)

Proposal components that address the ranking criteria are underlined and a summary is provided on pages 30-33.

1. Stokesbury KDE and Bethoney ND. 2020. How many sea scallops are there and why does it matter? *Frontiers in Ecology and the Environment*. doi:10.1002/fee.2244.
2. Bethoney ND and Stokesbury KDE. 2019. Implications of extremely high recruitment: crowding and reduced growth within spatial closures. *Marine Ecology Progress Series* 611:157-165.
3. Bethoney ND, Cleaver C, Ascì SC, Bayer SR, Wahle RA, Stokesbury KDE. 2019. A comparison of drop camera and diver survey methods to monitor Atlantic sea scallops (*Placopecten magellanicus*) in a small fishery closure. *Journal of Shellfish Research* 38(1):43-51.
4. Stokesbury KDE, Bethoney ND, Georgianna D, Inglis S, Keiley EF. 2019. Convergence of a disease and litigation leading to increased scallop discard mortality and economic loss in the Georges Bank, USA fishery. *North American Journal of Fisheries Management* 39(2):299-306.

RELEVANT GRANTS RECEIVED AS A PRINCIPAL INVESTIGATOR IN LAST 3 YEARS:

1. “Empowering fishermen to collect essential data; Piloting the Research Fleet approach in the Atlantic Sea scallop fishery” April 2021
Awarded from: National Oceanic and Atmospheric Administration
Value: \$121,260
2. “Catalyzing the restoration and conservation of the Bay scallop” January 2021
Awarded from: The Sarah de Coizart Charitable Trust
Value: \$52,463
3. “Supplement to Piloting a Low-Bycatch Commercial Squid Jig Fishery in Southern New England” December 2020
Awarded from: Mid-Atlantic Fisheries Management Council
Value: \$22,500
4. “Piloting Underwater Video to Improve Ghost Gear Removal” November 2020
Awarded from: 11th Hour Racing/The Schmidt Family Foundation
Value: \$32,000
5. “Piloting a Low-Bycatch Commercial Squid Jig Fishery in Southern New England” September 2020
Awarded from: National Oceanic and Atmospheric Administration
Value: \$196,256
6. “South Fork Wind Farm Fisheries Monitoring Plans” August 2020
Awarded from: Deepwater Wind South Fork LLC
Value: \$2,528,044
7. “American lobster and Jonah crab Research Fleet: A Collaborative Fishing Vessel Approach to Addressing Data Needs for the American lobster and Jonah crab fisheries” August 2020
Awarded from: Atlantic States Marine Fisheries Commission
Value: \$285,714
8. “Assessing Vulnerability of the Atlantic Sea Scallop Social-Ecological System in the Northeast Waters of the US” July 2020
Awarded from: National Oceanic and Atmospheric Administration
Value: \$159,526
9. “CFRF’s Lobster and Jonah Crab Research Fleet: A Collaborative Fishing Vessel Approach to Addressing Data Needs for the American Lobster and Jonah Crab Fisheries” June 2020
Awarded from: National Oceanic and Atmospheric Administration
Value: \$194,983
10. “Cooperative Marine Research Projects” May 2020
Awarded from: The Campbell Foundation
Value: \$90,000

Rhode Island Department of Environmental Management & Commercial Fisheries Research Foundation
ACCSP Funding Proposal (Maintenance Project – Project Year 7, Maintenance Year 5): Fishery Dependent Sampling for Black Sea Bass (*Centropristis striata*)

Proposal components that address the ranking criteria are underlined and a summary is provided on pages 30-33.

Thomas E. Heimann

114 Olney Street Unit 1
Providence, RI 02906
(508)728 3401
theimann@cfrfoundation.org

EDUCATION

NORTHEASTERN UNIVERSITY
Master's: Marine Biology, Jan 2016

Boston, MA

PRESCOTT COLLEGE
B.A. Marine Science, May 2013

Prescott, AZ

RELATED WORK EXPERIENCE

Commercial Fisheries Research Foundation
Research Biologist

South Kingston, RI
Sep 2016 – Present

- Research project management position working collaboratively with the Rhode Island fishing industry as well as state and federal fisheries management bodies. Responsible for management of both Black sea bass Research Fleet and Quahog Research Fleet as well as lead at-sea sampler for the Southern New England Cooperative Ventless Trap Survey. Duties include Fleet support and training, sampling protocol development, database management, data manipulation and statistical analysis, report writing, at-sea sampling on lobster vessels, grant writing, and outreach.

Northeastern University
Diving Research Methods Teaching Assistant

Nahant, MA
Sep 2015 – Oct 2015

- Employed by Northeastern University to be a teacher's assistant for an intensive American Academy of Underwater Sciences diving research methods course. Duties included demonstrating underwater research and diving skills, minor SCUBA gear maintenance and repair, and supervision of student divers.

Mote Marine Laboratory
Research Experience for Undergrads, National Science Foundation Intern

Sarasota, FL
May 2012 – Jul 2012

- Highly competitive National Science Foundation funded internship at Mote Marine Laboratory in Florida. Worked closely with a postdoctoral fellow on an independent research project in sensory biology and behavior of the common snook, a local sportfish. Project dealt specifically with the impacts of the hatchery rearing environment on the survival of released fish in the wild. Worked extensively with Microsoft Excel for data analysis.

Sheriff's Meadow Foundation
Ecological Stewardship Intern

Vineyard Haven, MA
May 2010 – Aug 2010

- Summer Intern position on Martha's Vineyard. Responsibilities included property management, boundary mapping, invasive species control, vegetation identification, and tour guide.

SCIENTIFIC PUBLICATIONS

Malek Mercer, A.J., Ellertson, A., Spencer, D., and **Heimann, T.** 2018. Fishermen fill data gaps for American lobster (*Homarus americanus*) and Jonah crab (*Cancer borealis*) in the Northeast USA. Bulletin of Marine Science, 94:3, pp 1121-1135.

SELECTED PRESENTATIONS

Heimann, T., McManus, C., Leavitt, D., Malek Mercer, A.J. 2018. Methods for Establishing a Quahog (*Mercenaria mercenaria*) Industry-Based Research Fleet for expansion of Fishery Dependent Data Sources. National Shellfisheries Association Annual Meeting. Seattle, Washington.

Heimann, T., McManus, C., Leavitt, D., Malek Mercer, A.J. 2018. Engaging Fishermen to Address Data Gaps and Evolve Management of the Quahog in Narragansett Bay. Southern New England Chapter of the American Fisheries Society Winter Meeting. New Bedford, MA.

Heimann, T., Malek Mercer, A.J., and McNamee, J. 2018. Advancing Fishery Dependent Data Collection for Black Sea Bass (*Centropristis striata*) in Southern New England and Mid-Atlantic Region Using a Fishing Vessel Research Fleet Approach. American Fisheries Society 148th Annual Meeting. Atlantic City, New Jersey.*

Heimann, T., Malek Mercer, A.J., and McNamee, J. 2019. Using Fishermen-Collected Data to Explore the Black Sea Bass (*Centropristis striata*) Population and Construct Gear-Specific Discard Characterizations. Southern New England Chapter of the American Fisheries Society Winter Meeting. Storrs, Connecticut.

Heimann, T., McManus, C., Leavitt, D., Malek Mercer, A.J. 2019. Quantifying Quahogs (*Mercenaria mercenaria*) in Narragansett Bay: Insights from a Collaborative Sampling Program. Southern New England Chapter of the American Fishery Society Winter Meeting. Storrs, Connecticut.

Heimann, T., Malek Mercer, A.J., and McNamee, J. 2019. Using Industry Collaboration to Improve Black Sea Bass Management. Wakefield Fisheries Symposium. Anchorage, Alaska.

CERTIFICATIONS AND SKILLS

- Statistical Language R (Commonly used packages; ggplot, shiny, sp)
- MySQL
- ArcGIS
- American Academy of Underwater Sciences Scientific Diver Certificate
- PADI Rescue Diver Certificate
- At-Sea Safety Training Certificate
- Experienced in Small Boat Operations

References:

- Atlantic Coastal Cooperative Statistics Program (ACCSP). 2022. Biological Sampling Priority Matrix. 4 p.
- Atlantic States Marine Fisheries Commission (ASMFC). 2013. Research Priorities and Recommendations to Support Interjurisdictional Fisheries Management. Special Report # 89. ASMFC, Arlington, VA. 58pp.
- Bell, R. J., Richardson, D.E., Hare, J.A., Lynch, P.D., and Fratantoni, P.S. 2014. Disentangling the effects of climate, abundance, and size on the distribution of marine fish: an example based on four stocks from the Northeast US shelf. *ICES Journal of Marine Science*: fsu217.
- Drohan, A. F., J. P. Manderson, and D. B. Packer. 2007. Essential fish habitat source document: Black sea bass, *Centropristis striata*, life history and habitat characteristics. 2nd Edition. NOAA Technical Memo. NMFS-NE-200, 78 p.
- Moser, J., and G. R. Shepherd. 2009. Seasonal distribution and movement of black sea bass (*Centropristis striata*) in the Northwest Atlantic as determined from a mark-recapture experiment. *Journal of Northwest Atlantic Fishery Science* 40: 17-28.
- Nelson, G.A. 2014. Cluster Sampling: A Pervasive, Yet Little Recognized Survey Design in Fisheries Research. *Transactions of the American Fisheries Society* 143 (4): 926-938.
- Northeast Fisheries Science Center (NEFSC). 2011. 53rd Northeast Regional Stock Assessment Workshop (53rd SAW) Assessment Report. US Department of Commerce, Northeast Fish Science Center Reference Document 12-05; 559 p.
- Northeast Fisheries Science Center (NEFSC). 2017. 62nd Northeast Regional Stock Assessment Workshop (62nd SAW). Assessment Summary Report. US Department of Commerce, Northeast Fish Science Center Reference Document 17-01; 37 p.
- Musick, J. A., and L. P. Mercer. 1977. Seasonal distribution of black sea bass, *Centropristis striata*, in the Mid-Atlantic Bight with comments on the ecology of fisheries of the species. *Transactions of the American Fisheries Society*. 106: 12-25.
- Southeast Fisheries Science Center (SEFSC). 2013. Stock Assessment of Black Sea Bass off the Southeastern United States: SEDAR Update Assessment. 102 p.
- SEDAR. 2018. SEDAR 56 – South Atlantic Black Seabass Assessment Report. SEDAR, North Charleston SC. 164 pp.
- Steimle, F. W., C. A. Zetlin, P. L. Berrien, and S. Chang. 1999. Essential fish habitat source document: Black sea bass, *Centropristis striata*, life history and habitat characters. NOAA Technical Memorandum NMFS-NE-143: 1-42.
- Waltz, W., Roumillat, W.A., and P. K. Ashe. 1979. Distribution, age structure, and sex composition of the black sea bass, *Centropristis striata*, sampled along the southeastern coast of the United States. Marine Resources Research Institute, South Carolina Wildlife and Marine Resources Department. Technical Report Number 43, December 1979.

Zhang, Y. and S.X. Cadrin .2013. Estimating Effective Sample Size for Monitoring Length Distributions: A Comparative Study of Georges Bank Groundfish, Transactions of the American Fisheries Society 142 (1): 59-67.



MARYLAND - VIRGINIA
"Potomac River Compact of 1958"

Potomac River Fisheries Commission

P.O. BOX 9

Colonial Beach, Virginia 22443

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June 15, 2022

Atlantic Coastal Cooperative Statistics Program
1050 N. Highland St. Ste. 200 A-N
Arlington, VA 22201

Dear ACCSP:

The Potomac River Fisheries Commission (PRFC) is pleased to submit its proposal for the Fiscal Year 23 ACCSP Request for Proposal, titled "FY23: Electronic Trip-Level Reporting or the Potomac River Fisheries Commission Commercial Fisheries Sector" for your consideration. The continued maintenance of this project enabled PRFC to continue to expand its electronic catch reporting leveraging the ACCSP eTrips application while simultaneously improving accuracy, timeliness, and level of detail for catch reporting throughout the Potomac River.

PRFC has made significant progress in the first two years of this project to include the initial groups of testers gaining access to eTrips, PRFC developed training, initial ACCSP-PRFC interface development, Oracle Cloud Infrastructure (OCI) Infrastructure as a Service (IaaS)/Platform as a Service (PaaS) procurement, and the development of the new Sport & commercial Application Integrated Licensing (SAIL) tool.

The Year 3 proposal is an exciting opportunity for ACCSP and PRFC to maintain momentum as a larger portion of the PRFC license holders switch to eTrips for their catch reporting and improved data interfaces are constructed for bi-directional data management between SAFIS and SAIL. Thank you for your consideration and please reach out to Marty Gary with any questions.

Sincerely,

Martin L. Gary
Executive Secretary
(804)456-6935
martingary.prfc@gmail.com

Proposal for Funding made to:
Atlantic Coast Cooperative Statistics Program
Operations and Advisory Committees
150N. Highland Street, Suite 200 A-N
Arlington, VA 22204



FY23: Electronic Trip-Level Reporting for the
Potomac River Fisheries Commission
Commercial Fisheries Sector
Revised as of 8/15

Submitted by:
Martin L. Gary
Executive Secretary
Potomac River Fisheries Commission
222 Taylor Street
Colonial Beach, VA 22443
martingary.prfc@gmail.com

Applicant Name: Potomac River Fisheries Commission

Project Title: **Electronic Trip-Level Reporting for the Potomac River Fisheries Commission (PRFC) Commercial Fisheries Sector**

Project Type: Maintenance Project
(No change in scope of work, continued emphasis on Electronic Data Reporting using eTrips, increasing participation, and integration with PRFC databases)

Principal Investigator: Martin L. Gary, PRFC Executive Secretary

Project Manager: Martin L. Gary, PRFC Executive Secretary

Requested Award Amount: **\$215,328.11** for the year three maintenance project. This is intended to scale both participation and supporting IT infrastructure.

Requested Award Period: One year after receipt of funds

Objective: This is the third year of the project to report trip-level catch and effort data, using the ACCSP eTrips tools, from Commercial license holders who fish within the jurisdiction of the Potomac River Fisheries Commission (PRFC) continuing in the 2023 seasons, which begins in July 2023 for the FY23 licenses and January 2023 for the CY23 licenses.

Need:

ACCSP and its partner agencies have established the collection of trip-level data as the standard which all agencies should strive to reach and maintain. Over 60 years ago, PRFC began collecting catch and effort data from commercial shellfish (oyster and crab) and finfish permit holders, which are submitted weekly. Storage of the data in electronic databases has taken place since the late 1980s. Since that time, more details regarding the catch have been collected in terms of targeting specific locations, species, and gear. The data are reported at the trip-level on a daily basis and are submitted weekly to PRFC and provided to ACCSP twice annually for the previous calendar year.

The third year of the project will work to increase the use of census-style reporting by expanding the use of ACCSP eTrips technology among a group of PRFC Commercial license holders and evaluating the efficacy of this method compared to traditional methods.

Participating license holders will use ACCSP eTrips tools to report their catch and effort in PRFC managed waters. In Year 3, the plan is to transition all eTRIPS users to electronic catch reporting only. Only allowing paper reports provided to PRFC to be submitted by PRFC staff for the waterman who do not use eTRIPS. Electronic harvest reporting has been discussed in the proceedings of meetings of advisory committees to the PRFC and the Commission itself for several years, and numerous harvesters have expressed an interest and willingness to participate. Many commercial constituents are already participating in electronic harvest reporting in Maryland or Virginia and are eager for similar opportunities to report electronically for PRFC.

Results and Benefits:

During the third year of the project, trip-level reporting to collect catch and effort data from commercial permit holders - harvesters is a goal for all ACCSP partners. On average, on an annual basis (Table 1):

Table 1: Average Count of License Holders and Daily Catch Reports for FY19 & CY19

Gear	License Holders	Daily Catch Reports
Oyster	215	300
Crab	432	11,500
Fish	742	14,000

Presently, the PRFC staff collect, organize, validate, obtain corrections, and enter the catch data for each License Holder - Harvesters, which is a rather labor-intensive effort that potentially induces errors and is time consuming; therefore, the data stored and available for decision making reports can be lagging. **The anticipated benefits use of ACCSP eTrips are faster data entry with less errors and less staff hours required.**

Data Delivery Plan: During the third year of the project, ACCSP eTrips will collect all catch data reports either directly entered by commercial harvesters or entered on their behalf by PRFC staff. PRFC will leverage the ACCSP eTrips database API to synchronize eTrips catch data with the current custom designed Microsoft Access Data Management System that has been in use for many years for ALL the catch data records that are NOT being entered directly into ACCSP eTrips by the commercial harvesters. The PRFC staff will be entering catch data for some of the paper reports that are submitted to PRFC by the commercial harvesters (see Task 2 in the Approach).

PRFC will continue transmitting data twice per year for all catch reports submitted for the prior year but excluding the records that have been entered into ACCSP eTrips. This will be discontinued once two consecutive reports show 100% consistency with data from ACCSP eTrips.

Approach:

During the third year of the project, PRFC will fully transition from the legacy Microsoft (MS) Access databases and Operator interface code that require all license issuing and catch data reporting performed by PRFC staff. PRFC will continue to expand its participation rate and update/improve training processes and materials. Additionally, PRFC will maintain a contract with a Software Development provider company or consultant to continue to maintain relevant interfaces and continue to develop the upgraded cloud application.

During Year 3, PRFC will be in maintenance for the following items:

1. Task 1 Identification of License Holder Participants: Continued Identification of commercial harvesters to participate:

In the third year of the project, continue to expand participation in the project. The commercial harvester community is comprised of a mix of limited entry and open access fishery participants. Though the number varies year to year, approximately 1,400 commercial harvesters are candidates, and based upon the most recent license metrics, the target would be an additional 30% = 840 participants in year three for ACCSP eTrips. The participants will be volunteers. This would provide a large portion of the existing license holders (50%) and each Gear category. These numbers are manageable for the purpose of refining the SAIL application and the integration interfaces between eTrips and SAFIS tools, developing enhanced training guides & gaining feedback for future participant expansion.

2. Task 2 eTrips installation & training; data entry: ACCSP eTrips installation and training for commercial harvesters. It is anticipated that on average, four (4) hours will be provided to each harvester to support on data entry, submission and use of mobile devices and software. Included within the four hours are staff hours for making presentations at meetings, developing/updating “cheat sheet” guides, and identifying enhancements and overall process improvement. In addition to the harvesters, the PRFC staff will enter a sampling of a variety of paper catch reports into ACCSP eTrips:

The PRFC staff will augment the commercial harvesters ACCSP eTrips submissions to ensure a more comprehensive data set is being processed for the purpose of identifying enhancement requests for the ACCSP eTrips tools and the data can be successfully processed (downloaded, modified / corrected, and uploaded).

3. Task 3 MS Access Operator Interface Maintenance: **Maintenance of MS Access required interfaces until ACCSP eTrips collected is data is verified as 100% matching with PRFC records:**
 - a. Download ACCSP eTrips data from ACCSP

- b. Maintain an Operator Interface to validate downloaded data
- c. Upload verified data to ACCSP

In Year 3, this function will be completely developed and no longer necessary to support. **All support will instead be to the new Sport & commercial Application Integrated Licensing tool (SAIL) to enhance its capabilities and align with eTRIPs and SAFIS reporting.**

- 4. Task 4 Software Development: During year three of the project, PRFC intends to expand its modern database platform: SAIL. SAIL is a cloud-based application with a more consistent Operator Interface and is able to be upgraded more efficiently. The requirements will be documented, and the selected vendor will continue to develop and implement. **This effort will look to grow SAIL's capabilities from the original MS Access Database to a modern, scalable, web first tool that can more effectively capture and report on PRFC catch information in real time using advanced analytics.**
- 5. Task 5 Maintain Oracle Cloud Database: During year three of the project PRFC will continue to procure cloud-based resources with a focus on providing cost savings up-front and long term during the sustainment and maintenance phases.
- 6. Task 6 Develop & Maintain Oracle web-based applications: Continue development and maintenance of web based PRFC applications to perform PRFC office automation functions:
 - a. Process License issue and renewal requests
 - b. Print Licenses and associated tags, flags, and catch report forms, etc.
 - c. Processing paper catch reports
 - d. Reporting interface – currently there are approximately 25 unique reports with many that have sub-options
 - e. Database Utility interface – currently there are approximately 13 unique operations required to modify lookup tables, set/re-set sequencing, and perform database integrity checks and repair
 - a. Perform modifications as necessary to resolve technical problems
 - b. Perform updates as necessary to support new requirements

The current (historical) PRFC data was exported, reformatted, and imported into the new SAIL database system.

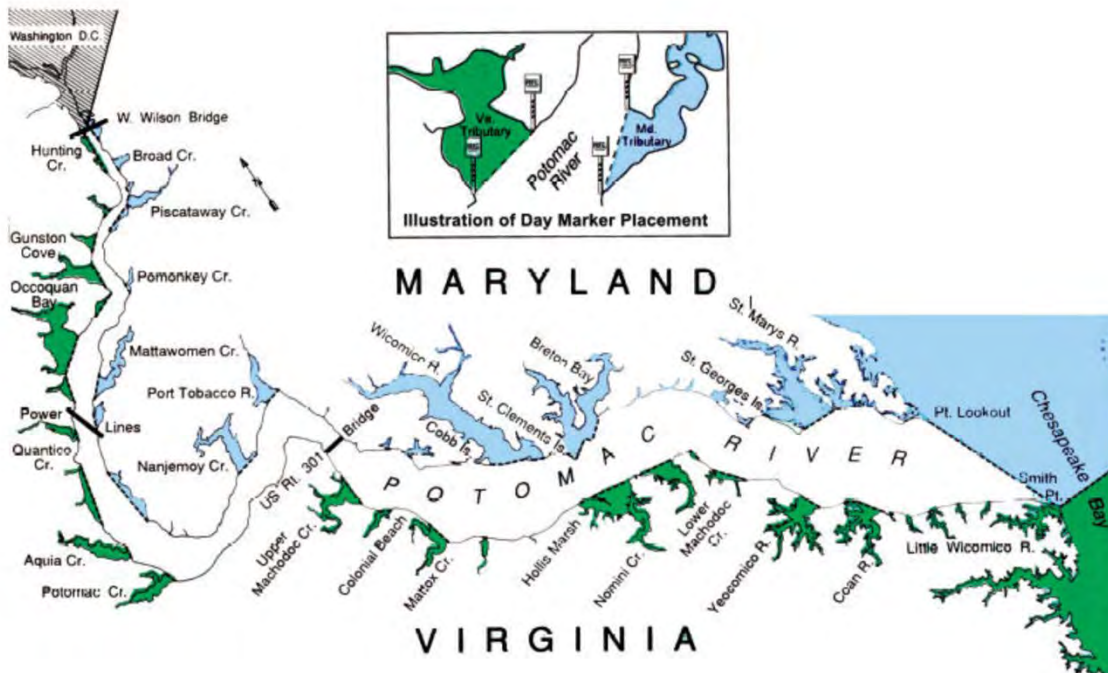
- 7. Task 7 Commercial Harvesters increased participation: Continue to increase the number of commercial harvesters using the ACCSP eTrips-tools:

The goal would be to have 100% of the commercial harvesters using the ACCSP eTrips tools in Year 3 where able and supported by PRFC staff where not.

To facilitate the effort to meet these goals:

- i. Provide direct support as needed using PRFC staff via phone or in-person
- ii. Presentations at various Committee meetings with demonstrations and open for questions
- iii. Creating short “tri-fold” instructions specific to various topics
- iv. Creating short YouTube video tutorials specific to various topics
- v. Utilize existing ACCSP support products (e.g., videos, tech support and other)
- vi. Incentivizing future participation by using various strategies, such as:
 1. Successful strategies used by other jurisdictions (e.g., Rhode Island license endorsement)
 2. Establishing a fee for having the PRFC staff perform the ACCSP eTrips data entry such as a flat fee - \$100 per License Holder per year
 3. Fee per Gear Type - \$25 for each gear type license
 4. Fee per Week per Gear Type - \$5 for each weekly report for each gear type license

Geographic Location: Jurisdictional waters of the Potomac River Fisheries Commission. From the Woodrow Wilson Bridge (District of Columbia Demarcation) downriver to the confluence of the Chesapeake Bay. Approximately 100 nautical miles.



Milestone Schedule:

Task # / Month	Project Period Month											
	1	2	3	4	5	6	7	8	9	10	11	12
T1: Identification of License Holder Participants			X			X			X			X
T2: eTrips installation & training; data entry	X	X	X	X	X	X	X	X	X	X	X	X
T3: MS Access Operator Interface Maintenance	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
T4: Software modifications	X	X	X	X	X	X	X	X	X	X	X	X
T5: Maintain Oracle Cloud Database	X	X	X	X	X	X	X	X	X	X	X	X
T6: Develop & Maintain Oracle web-based applications	X	X	X	X	X	X	X	X	X	X	X	X
T7: Commercial Harvesters increased participation	X	X	X	X	X	X	X	X	X	X	X	X

Project Accomplishments Measurement:

The results of this project will provide the basis to improve the accuracy and timeliness of catch and effort estimations, and could subsequently inform science, stock assessments, and management policies.

The results will help determine the scope of the effort to migrate to a more robust database system that is more accessible to the Commercial License Holders.

PRFC in Year 1 completed one task fully and made progress on many others.

1. Year 1 Task 5 Completed: Established contract for the software development work required to complete Tasks 3 through 6.

PRFC in Year 2 completed five tasks for the year, with several repeating each cycle.

1. Year 2 Task 1 Completed: Identified and trained 20% of license holders with most moving to full time electronic catch reporting.
2. Year 2 Task 2 Completed: Developed eTrips installation and training guides/data for use by the license holders.
3. Year 2 Task 3: Completed all maintenance on the Access Database and have shut it down with full time operations shifting to SAIL.
4. Year 2 Task 4: Completed initial round of software modifications to support the reporting and synchronization between the Access DB and SAIL.
5. Year 2 Task 5 Completed: Maintained contract for the software development work required to complete Tasks 3 through 6. Established Oracle Cloud Infrastructure (OCI) account and procured the Infrastructure-as-a-Service (IaaS) for use in SAIL.
6. Year 2 Task 6 Completed: Completed initial development on the OCI hosted, SAIL application. Iterated through team and volunteer issues to.

PRFC will continue to monitor progress and accomplishment using the following goals and measurements.

Task	Goal	Measurement
T1: Identification of License Holder Participants	Identification of additional 30% commercial harvesters to target for enrollment in eTrips electronic catch reporting.	Records updated to reflect they have been contacted and notified about the opportunity and its benefits.
T2: eTrips installation & training; data entry	100% of identified eTrips participants who request training/support receive in person or electronic training/support.	Participant records updated to note whether training has been provided and support provided.
T3: MS Access Operator Interface Maintenance	100% completion and execution of the interface steps.	Verification that the steps executed correctly and ACCSP/PRFC data is synchronized.
T4: Software modifications	100% of requirements documented in RTM and updated to reflect Year 3 changes in process or ACCSP data requirements.	Verification that RTM is completed and updated.
T5: Maintain Oracle Cloud Database	100% of cloud-based services procured and available.	Verification by PRFC staff that cloud services are invoiced and available.

T6: Develop & Maintain Oracle web-based applications	100% of year 3 requirements identified, developed, and delivered.	Completed RTM showing Year 3 requirements marked as complete and verification by PRFC staff.
T7: Commercial Harvesters increased participation	Marketing materials developed and presented at regular meetings and in routine communications. Incentives identified and presented to the PRFC Commissioners for approval.	Verification by PRFC staff that materials were sent and communicated during meetings. Documented minutes showing discussions at Commissioner meeting.

Project Funding Justification for Continuance / Transition Plan:

PRFC is requesting the same level of funding as the previous two years due to the amount of work and license holders still not using electronic catch reporting. While great achievements have been made over the previous two years, there is still a good amount of effort to synchronize the PRFC SAIL catch report information with SAFIS in a way that does not cause harm to overall data quality. Additionally, there are a large number of license holders that will take significant outreach and training to get them onboard with using eTrips as a replacement for the paper forms. PRFC has detailed plans to address both of these factors in Year 3.

Funding transition is expected for this project beginning in Year 6 when funding is reduced based on maintenance project rules. PRFC is working to complete all development and activities by Year 7 to minimize funding necessary to keep SAIL and eTrips usage. PRFC will leverage new state resources and existing IT budgets to cover SAIL OCI expenses and additional routine maintenance costs.

BUDGET FOR PROPOSAL PLANNING – FY2023

Description	Calculation	ACCSP Cost	PRFC Cost	Total Cost
Personnel (a)				
Principle Investigator	60 ACCSP / 100 PRFC hours @ 56.46/hr	\$3,387.60	\$5,646.00	\$9,033.60
Data Administrator	200 ACCSP / 1880 PRFC hours @ 22.4/hr	\$4,480.00	\$42,112.00	\$46,592.00
Data Management Specialist	600 ACCSP / 1480 PRFC hours @ 12.21/hr	\$7,326.00	\$18,070.80	\$25,396.80
Personnel Subtotal		\$15,193.60	\$65,828.80	\$81,022.40
Fringe (b)				
Principle Investigator	15% of salary	\$523.44	\$17,622.48	\$18,145.92
Data Administrator	49% of salary	\$2,192.47	\$20,609.21	\$22,801.68
Data Management Specialist	50% of salary	\$3,630.00	\$8,953.92	\$12,583.92
Fringe Subtotal		\$6,345.91	\$47,185.61	\$53,531.52
Travel (c)				
n/a				
Travel Subtotal		\$0.00	\$0.00	\$0.00
Equipment (d)				
Oracle Cloud Database:				
a. MySQL DB Services 1 instance, 31 days/month, 24 hours/day 1 OCPU 16 GB RAM 50 GB storage 50 GB backup	\$58/month x 12 months	\$696.00	\$0.00	\$696.00
b. Java Cloud Service Enterprise Edition 1 instance, 31 days/month, 24 hours/day	\$461month x 12 months	\$5,532.00	\$0.00	\$5,532.00

Potomac River Fisheries Commission (PRFC)
 ACCSP Funding Proposal: Electronic Trip-Level Reporting for the PRFC Commercial Fisheries Sector
Bold Comments indicate sections that help with the ranking process
Highlighted text indicates changes from the first submission

2 OCPU				
c. Cloud Infrastructure 1 instance, 31 days/month, 24 hours/day 2 X9 OCPU 32 GB X9 RAM 50 GB storage	\$164/month x 12 months	\$1,968.00	\$0.00	\$1,968.00
d. Oracle APEX 1 instance, 31 days/month, 24 hours/day 2 OCPU 1 TB Storage	\$598/month x 12 months	\$7,176.00	\$0.00	\$7,176.00
Equipment Subtotal		\$15,372.00	\$0.00	\$15,372.00
Supplies (e)				
n/a				
Supplies Subtotal		\$0.00	\$0.00	\$0.00
Contractual (f)				
In-house Consultant/Developer	387 Hours @ \$103/hr	\$39,861.00	\$0.00	\$39,861.00
Vendor/Developer	1121 Hours @ \$123.6/hr	\$138,555.60	\$0.00	\$138,555.60
Contractual Subtotal		\$178,416.60	\$0.00	\$178,416.60
Other (h)				
n/a				
Other Subtotal		\$0.00	\$0.00	\$0.00
Totals				
Total Direct Charges (i)		\$215,328.11	\$113,014.41	\$328,342.52
Indirect Charges (j)	n/a	\$0.00	\$0.00	\$0.00
Total (sum of Direct and Indirect) (k)		\$215,328.11	\$113,014.41	\$328,342.52
Percentage		66%	34%	100%

BUDGET NARATIVE (Funding Period, FY23)

Project: Electronic Trip-Level Reporting for the Potomac River Fisheries Commission (PRFC) Commercial Fisheries Sector

Project Period: 1 March 2022 – 28 February 2023

1 Year Funding: \$215,328.11

Prepared By: Martin L. Gary, PRFC Executive Secretary

Personnel (Salaries) \$15,193.60: Three PRFC employees' salary time will be covered using these funds. The three employees are: Principle Investigator, for 60 hours (\$3,387.60); Data Administrator, for 200 hours (\$4,480.00), and a Data Management Specialist, for 600 hours (\$7,326.00).

In-Kind \$113,014.41: The three PRFC employees proposed in this effort spend most if not all of their remaining hours working on catch report data and the tool. For each employee, their salary + Fringe costs not covered by the ACCSP grant is considered In-Kind by the PRFC. For this proposal Principle Investigator (100 hours, \$5,646.00 + \$17,622.48 Fringe), Data Administrator (1880 hours, \$42,112.00 + \$42,112.00 Fringe), and Data Management Specialist (1480 hours, \$18,070.80 + \$8,953.92 Fringe) sum up to \$113,014.41 or 34% of total expense for Year 3.

Fringe Benefits \$5,950.00: The current PRFC fringe benefit cost is set per employee at: Principle Investigator at 15% of Salary (\$523.44), Data Administrator at 49% of salary (\$2,192.47), and Data Management Specialist at 50% of salary (\$3,630.00). The Principle Investigator falls within the fringe guidelines set forth by NOAA, however, a full breakdown of how the Fringe Benefits are calculated below (PRFC does not have a NICRA established).

Fringe Benefits Details				
		Principle Investigator	Data Administrator	Data Management Specialist
Gross	Annually	\$117,436.80	\$46,592.00	\$25,396.80
	Hourly	\$56.46	\$22.40	\$12.21
Fringe	Health	N/A	\$15,840.00	\$8,572.80
	Retirement	\$15,972.24	\$6,337.20	\$3,454.80 (Inc. Mission Square)
	Life	\$1,573.68	\$624.48	\$340.32
	Disability			\$216.00 (VLDP)
	Def Comp	\$600.00		
	Total	\$18,145.92	\$22,801.68	\$12,583.92

	Per Hour	\$8.72	\$10.96	\$6.05
	Rate	15%	49%	50%
ACCSP Project Hours				
FY 22-23 Hours / Year:		2080		
	ACCSP Hours	60	200	600
	Fringe Cost	\$523.44	\$2,192.47	\$3,630.00
	ACCSP Cost	\$3,387.60	\$4,480.00	\$7,326.00
	PRFC Hours	100	1880	1480
	PRFC Fringe	\$17,622.48	\$20,609.21	\$8,953.92
	PRFC Cost	\$5,646.00	\$42,112.00	\$18,070.80

Travel \$0.00: N/A

Equipment \$15,372.00: Oracle Cloud Infrastructure (OCI) resources are procured to host the PRFC interface between ACCSP and PRFC's MS Access application on a monthly basis. Additionally, PRFC's modernized application runs on the OCI infrastructure as well.

Supplies \$0.00: N/A

Contractual \$178,416.60:

In-house Consultant – Ray Draper: \$39,861.00

Updating the existing PRFC Access based application will require the knowledge and expertise of the consultant/developer Ray Draper. Ray has designed and developed the entire PRFC application from the ground up over the last 15 years and will be the primary developer of the ACCSP interface. This work will require five (5) months of part-time development work, estimated at 501 hours total, and PRFC has contracted with Ray at a rate of \$100 an hour to perform these services.

Talent & Technical Solutions Corporation (TTSC): \$138,555.60

Developing a new PRFC database, procuring cloud services and infrastructure, and assisting with the PRFC existing application integration will be handled by TTSC. PRFC has contracted with TTSC at a rate of \$130 an hour and expects the work to support T3, T4, T6, and T7 to take 12 months of part-time work and an estimated 1,180 hours.

Other \$0.00: N/A

Summary of Proposal for Ranking

Project Details

Proposal Type: Maintenance

Primary Program Priority:

Catch and Effort (10 points / 100%): 100% of license holders will be providing electronic catch reporting.

Data Delivery Plan (2 points): All data from license holders using eTrips will go directly to SAFIS database. PRFC personnel will transfer remaining catch reports to SAIL which will use an interface to transfer to SAFIS.

Project Quality Factors

Multi-Partner/Regional impact including broad applications (5 points): PRFC's migration to eTrips and electronic catch reporting will benefit ACCSP and all regional partners in ensuring they have access to accurate, timely data on PRFC monitored species.

Contains funding transition plan (4 points): A detailed justification and funding transition plan is laid out in the proposal. PRFC sees a large need to continue funding at current levels in Year 3 with reduced funding in the out years and a transition to routing IT budgets and other state grants.

In-kind contributions (2 points): PRFC has provided a breakdown of the in-kind contributions made in support of this program and show that PRFC is providing 34% In-kind contributions. The contributions are significant and cover all the time for three personnel that manage and oversee the current catch reporting system.

Improvement in data quality/quantity/timeliness (4 points): Transition to eTrips and PRFC's new SAIL application will greatly increase the timeliness of reporting from bi-annually to almost real time. This will reduce manual entry and ensure much high-quality data is available for review by PRFC and other members.

Potential secondary module as a by-product (3 points): This project has led to the development of SAIL which will greatly streamline PRFC operations and interactions with ACCSP's SAFIS.

Impact on stock assessment (3 points): Regional management organizations that perform stock assessments will have better data to operate from as a direct result of this proposal and continued funding for PRFC's efforts.

Other Factors

Achieved Goals (3 point): PRFC has achieved a great number of its goals over the last two years and has plans to achieve more in Year 3 with this proposal.

Data Delivery Plan (2 points): A detailed data delivery plan has been included for review. PRFC will continue to work with ACCSP to increase speed of delivery as more electronic catch reports are captured and interfaces stood up.

Potomac River Fisheries Commission (PRFC)

ACCSP Funding Proposal: Electronic Trip-Level Reporting for the PRFC Commercial Fisheries Sector

Bold Comments indicate sections that help with the ranking process

Highlighted text indicates changes from the first submission

Level of Funding (1 points): PRFC has requested a smaller level of funding compared to FY22 as an acknowledgement for the large decrease in funding given up in Year 1 to help support other projects. It is projected that funding will decrease starting in Year 4 through 7.

Properly Prepared (1 point): PRFC followed all applicable ACCSP and RFP guidelines in preparing this document along with feedback gleaned from previous years proposal.

Merit (3 points): The Electronic Catch Reporting proposal is vital to the continued evolution of PRFC and ACCSP regional partners in implementing innovated processes for increasing data capture, quality, and timeliness.

APPENDIX A: BUDGET - FY2021 - APPROVED BY ACCSP

Description	Calculation	Cost
Personnel (a)		
Principle Investigator	60 hours @ \$55.50/hr	\$3,330.00
Data Administrator	200 hours @ \$20.50/hr	\$4,100.00
Data Management Specialist	600 hours @ \$11.50/hr	\$6,900.00
Fringe (b)		
Principle Investigator	14% of salary	\$455.55
Data Administrator	51% of salary	\$2,092.93
Data Management Specialist	49% of salary	\$3,401.46
Travel (c)		
n/a		
Equipment (d)		
Oracle Cloud Database:		
a. MySQL DB Services 1 instance, 31 days/month, 24 hours/day 50 GB storage 50 GB backup	\$21/month x 8 months	\$168.00
b. Java Cloud Service Enterprise Edition 1 instance, 31 days/month, 24 hours/day	\$550/month x 8 months	\$4,400.00
c. Cloud Infrastructure 1 instance, 31 days/month, 24 hours/day 50 GB storage	\$33/month x 8 months	\$264.00
Supplies (e)		
n/a		
Contractual (f)		
In-house Consultant/Developer	501 hours @ \$100/hr	\$50,100.00
Vendor/Developer	1,080 hours @ \$130/hr	\$140,400.00
Other (h)		
n/a		
Totals		
Total Direct Charges (i)		\$215,612.00
Indirect Charges (j)	n/a	\$0.00
Total (sum of Direct and Indirect) (k)		\$215,612.00

BUDGET NARATIVE

(Requested Funding Period, FY21)

Project: Electronic Trip-Level Reporting for the Potomac River Fisheries Commission (PRFC) Commercial Fisheries Sector

Project Period: 1 March 2020 – 28 February 2021

1 Year Funding: \$215,425.44

Prepared By: Martin L. Gary, PRFC Executive Secretary

Personnel (Salaries) \$14,759.90: Three PRFC employees' salary time will be covered using these funds. The three employees are: Principle Investigator, for 60 hours (\$3,429.90); Data Administrator, for 200 hours (\$4,223.00), and a Data Management Specialist, for 600 hours (\$7,107.00).

Fringe Benefits \$5,950.00: The current PRFC fringe benefit cost is set per employee at: Principle Investigator at 14% of Salary (\$455.55), Data Administrator at 51% of salary (\$2,092.93), and Data Management Specialist at 49% of salary (\$3,401.46). The Principle Investigator falls within the fringe guidelines set forth by NOAA, however, a full breakdown of how the Fringe Benefits are calculated below (PRFC does not have a NICRA established).

		Principle Investigator	Data Administrator	Data Management Specialist
Gross	Annually	\$ 111,000.00	\$ 41,000.00	\$ 23,000.00
	Hourly	\$ 55.50	\$ 20.50	\$ 11.50
Fringe	Health	\$ -	\$ 15,418	\$ 8,333
	Retirement	\$ 13,086	\$ 4,945	\$ 2,696
	Life	\$ 1,499	\$ 566	\$ 309
	Disability	\$ -	\$ -	
	Def Comp	\$ 600	\$ -	\$ -
	Total:	\$ 15,185	\$ 20,929	\$ 11,338
	Per Hour:	\$ 7.59	\$ 10.46	\$ 5.67
Hours / Year:	2000			
	Rate:	14%	51%	49%
		\$ 7.59	\$ 10.46	\$ 5.67
	Hours:	60	200	600
		\$ 455.55	\$ 2,092.90	\$ 3,401.40
	Total Cost:	\$ 3,330.00	\$ 4,100.00	\$ 6,900.00

Travel \$0.00: N/A

Equipment \$15,372.00: Oracle Cloud Infrastructure (OCI) resources are procured to host the PRFC interface between ACCSP and PRFC's MS Access application on a monthly basis. Additionally, PRFC's modernized application runs on the OCI infrastructure as well.

Supplies \$0.00: N/A

Contractual \$179,343.60:

In-house Consultant – Ray Draper: \$40,788.00

Updating the existing PRFC Access based application will require the knowledge and expertise of the consultant/developer Ray Draper. Ray has designed and developed the entire PRFC application from the ground up over the last 15 years and will be the primary developer of the ACCSP interface. This work will require five (5) months of part-time development work, estimated at 396 hours total, and PRFC has contracted with Ray at a rate of \$103 an hour to perform these services.

Talent & Technical Solutions Corporation (TTSC): \$138,555.60

Developing a new PRFC database, procuring cloud services and infrastructure, and assisting with the PRFC existing application integration will be handled by TTSC. PRFC has contracted with TTSC at a rate of \$123.60 an hour and expects the work to support T3, T4, T6, and T7 to take 12 months of part-time work and an estimated 1,121 hours.

Other \$0.00: N/A

APPENDIX B: BUDGET - FY2022 - APPROVED BY ACCSP

Description	Calculation	Cost
Personnel (a)		
Principle Investigator	60 hours @ \$57.57/hr	\$3,429.90
Data Administrator	200 hours @ \$21.12/hr	\$4,223.00
Data Management Specialist	600 hours @ \$11.85/hr	\$7,107.00
Personnel Subtotal		\$14,759.90
Fringe (b)		
Principle Investigator	14% of salary	\$455.55
Data Administrator	51% of salary	\$2,092.93
Data Management Specialist	49% of salary	\$3,401.46
Fringe Subtotal		\$5,949.94
Travel (c)		
n/a		
Travel Subtotal		\$0.00
Equipment (d)		
Oracle Cloud Database:		
d. MySQL DB Services 1 instance, 31 days/month, 24 hours/day 1 OCPU 16 GB RAM 50 GB storage 50 GB backup	\$58/month x 12 months	\$696.00
e. Java Cloud Service Enterprise Edition 1 instance, 31 days/month, 24 hours/day 2 OCPU	\$461month x 12 months	\$5,532.00
f. Cloud Infrastructure 1 instance, 31 days/month, 24 hours/day 2 X9 OCPU 32 GB X9 RAM 50 GB storage	\$164/month x 12 months	\$1,968.00
g. Oracle APEX 1 instance, 31 days/month, 24 hours/day 2 OCPU 1 TB Storage	\$598/month x 12 months	\$7,176.00
Equipment Subtotal		\$15,372.00
Supplies (e)		
n/a		
Supplies Subtotal		\$0.00

Contractual (f)		
In-house Consultant/Developer	396 hours @ \$103/hr	\$40,788.00
Vendor/Developer	1,121 hours @ 123.60/hr	\$138,555.60
Contractual Subtotal		\$179,343.60
Other (h)		
n/a		
Totals		
Total Direct Charges (i)		\$215,425.44
Indirect Charges (j)	n/a	\$0.00
Total (sum of Direct and Indirect) (k)		\$215,425.44

BUDGET NARATIVE

(Approved Funding Period, FY22)

Project: Electronic Trip-Level Reporting for the Potomac River Fisheries Commission (PRFC) Commercial Fisheries Sector

Project Period: 1 March 2021 – 28 February 2022

1 Year Funding: \$215,612.00

Prepared By: Martin L. Gary, PRFC Executive Secretary

Personnel (Salaries) \$14,330.00: Three PRFC employees' salary time will be covered using these funds. The three employees are: Principle Investigator, for 60 hours (\$3,330.00); Data Administrator, for 200 hours (\$4,100.00), and a Data Management Specialist, for 600 hours (\$6,900.00).

Fringe Benefits \$5,950.00: The current PRFC fringe benefit cost is set per employee at: Principle Investigator at 14% of Salary (\$455.55), Data Administrator at 51% of salary (\$2,092.93), and Data Management Specialist at 49% of salary (\$3,401.46). The Principle Investigator falls within the fringe guidelines set forth by NOAA, however, a full breakdown of how the Fringe Benefits are calculated below (PRFC does not have a NICRA established).

		Principle Investigator	Data Administrator	Data Management Specialist
Gross	Annually	\$ 111,000.00	\$ 41,000.00	\$ 23,000.00
	Hourly	\$ 55.50	\$ 20.50	\$ 11.50
Fringe	Health	\$ -	\$ 15,418	\$ 8,333
	Retirement	\$ 13,086	\$ 4,945	\$ 2,696
	Life	\$ 1,499	\$ 566	\$ 309
	Disability	\$ -	\$ -	
	Def Comp	\$ 600	\$ -	\$ -
	Total:	\$ 15,185	\$ 20,929	\$ 11,338
	Per Hour:	\$ 7.59	\$ 10.46	\$ 5.67
Hours / Year:	2000			
	Rate:	14%	51%	49%
		\$ 7.59	\$ 10.46	\$ 5.67
	Hours:	60	200	600
		\$ 455.55	\$ 2,092.90	\$ 3,401.40
	Total Cost:	\$ 3,330.00	\$ 4,100.00	\$ 6,900.00

Travel \$0.00: N/A

Equipment \$4,832.00: Oracle Cloud Infrastructure (OCI) resources are procured to host the PRFC interface between ACCSP and PRFC's MS Access application on a monthly basis. Additionally, PRFC's modernized application runs on the OCI infrastructure as well.

Supplies \$0.00: N/A

Contractual \$190,500.00:

In-house Consultant – Ray Draper: \$50,100.00

Updating the existing PRFC Access based application will require the knowledge and expertise of the consultant/developer Ray Draper. Ray has designed and developed the entire PRFC application from the ground up over the last 15 years and will be the primary developer of the ACCSP interface. This work will require five (5) months of part-time development work, estimated at 501 hours total, and PRFC has contracted with Ray at a rate of \$100 an hour to perform these services.

Talent & Technical Solutions Corporation (TTSC): \$140,400.00

Developing a new PRFC database, procuring cloud services and infrastructure, and assisting with the PRFC existing application integration will be handled by TTSC. PRFC has contracted with TTSC at a rate of \$130 an hour and expects the work to support T3, T4, T6, and T7 to take 12 months of part-time work and an estimated 1,180 hours.

Other \$0.00: N/A

APPENDIX C: Maintenance Projects History for Primary Program Priorities:

Funding Fiscal Year	Amount	Time Period	Results/Comments
2021	\$215,612.00	1 Mar 2020 – 28 Feb 2021	Pilot implementation of ACCSP eTrips and initial development of PRFC Interface & modernized cloud application
2022	\$215,612.00	1 Mar 2021 – 28 Feb 2022	Completed development of PRFC Cloud application SAIL v1.0, piloted eTrips with expanded waterman beta group, delivered initial SAFIS interface to synchronize data between PRFC SAIL v1.0 and SAFIS.
2023	TBD	1 Mar 2022 – 28 Feb 2023	Complete development of PRFC SAIL v2.0, finalize SAFIS-SAIL two way interface communication, expand pilot to 50% of waterman.

APPENDIX D: Resumes for all personnel proposed on the project

Martin L. Gary

Education

Texas A&M University: B.S. Wildlife & Fisheries Sciences May 1986

Specialization: Fisheries Ecology

Experience

Potomac River Fisheries Commission: July 2013 to Present

Executive Secretary

- Currently:
 - Co-Chair, NOAA Chesapeake Bay Program Sustainable Fisheries Goal Implementation Team
 - Chairman, Atlantic States Marine Fisheries Commission's Atlantic Striped Bass Board
 - President Elect, Tidewater Chapter of the American Fisheries Society
 - Member, Chesapeake Bay Program Invasive Catfish Work Group
 - Member, Maryland Sea Grant External Advisory Board 2016-Present
- Previously:
 - Co-Chair, Atlantic States Marine Fisheries Commission's Striped Bass Work Group (2020)
 - Chairman, Atlantic States Marine Fisheries Commission's American Eel Board (2017-2019)
Member, Interstate Commission for the Potomac River Basin (ICPRB) Blue Ribbon Panel for Comprehensive Watershed Planning (2017-2019)

Maryland Department of Natural Resources, Fisheries Service: (July 1985 through June 2013)

- Fisheries Service - Assistant Director (2006-2013)
- Fisheries Service – Program Manager for Recreational & Commercial Fisheries and Outreach (1996-2006)
- Fisheries Service – Program Manager for Recreational Fisheries and Commercial Striped Bass Fisheries (1995-1996)
- Fisheries Service – Legislative Officer (1994-1995)
- Fisheries Service – Striped Bass Stock Assessment Biologist (1990-1994)

- Fisheries Service – Program Manager for Artificial Reefs & Habitat Enhancement (1988- 1990)
- Fisheries Service: Estuarine Finfish Biologist (1986-1988)

Affiliations

American Fisheries Society Member American Fisheries Society Southern Division
 American Fisheries Society Tidewater Chapter (President Elect) American Fisheries Society Estuaries Section
 American Fisheries Society Invasive & Introduced Species Section American Fisheries Society Fish Habitat Section
 American Fisheries Society Fish Health Section American Fisheries Society Fish History Section American Fisheries Society Fish Management Section
 American Fisheries Society Fisheries Information & Technology Section
 American Fisheries Society Virginia Chapter Member
 American Fisheries Society Mid Atlantic Chapter Member
 American Fisheries Society Potomac Chapter
 American Fisheries Society Marine Fisheries Section American Fisheries Society Science Communication Section American Fisheries Society Socioeconomics Section American Fisheries Society Water Quality Section American Society of Ichthyologists & Herpetologists
 The Interstate Shellfish Sanitation Conference (ISSC)
 National Association of Underwater Instructors (NAUI Scuba certifications for: Advanced Open Water, Ice, Night, Cave, Nitrox)

Cathy Friend

WORK EXPERIENCE

Potomac River Fisheries Commission

Colonial Beach, VA

Administrative Specialist

Jan 2012 – Present

- Operate office equipment such as fax machines, copiers, electronic postage machines, and multi-line phone systems, and use computers for spreadsheet, word processing, database management, and other applications;
- Greet customers or callers and handle their inquiries or direct them to the appropriate person according to their needs;
- Prepare the daily cash report making sure all monies balance for the day, verifying receipts vs. monies received that day match;
- Prepare and mail law enforcement manual updates monthly;
- Review and process incoming commercial and recreational license applications; ensuring the correct fees are collected;
- Attend and record all advisory committee meetings and quarterly Commission meetings. Transcribe and prepare minutes from each meeting in a timely manner for review by the Executive Secretary;
- Update and prepare any regulation changes or supplement updates and mail to the appropriate recipients including Commission members, law enforcement, judges, and clerks;
- Adhere to mandatory time lines for preparing and distributing certain documents;
- Enter daily deposits into Quickbooks.

Database Specialist

Jun 2006 – Present

- Troubleshoot and fix any errors associated with the operating database, including contact the IT person for help if needed;
- Maintain the integrity of the data entered by ensuring proper procedures are followed;
- Accurately entering hand written harvest catch data received weekly through the mail and in person; and reach out to any harvester with discrepancies found;
- Adhere to regulations regarding commercial activities to include making sure regulations are followed and provided to harvesters;
- Respond to customer or management request for data by creating queries in the database.

NSWC Federal Credit Union

Dahlgren, VA

Positions held:

1992 - 2004

Human Resource Assistant

Mortgage and Home Equity Loan Officer

Mortgage Loan Clerk

Customer Service Teller

EDUCATION

Rappahannock Community College (1994 – 2000)

King George, VA

Completed coursework towards a A.S. Accounting Specialist (degree not obtained)

Potomac River Fisheries Commission (PRFC)

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ACCSP Funding Proposal: Electronic Trip-Level Reporting for the PRFC Commercial Fisheries Sector

Bold Comments indicate sections that help with the ranking process

Highlighted text indicates changes from the first submission

West Virginia University (1986 – 1991)

Morgantown, WV

Completed coursework towards B.S. Speech Pathologist (125 credit hours – degree not obtained)

ADDITIONAL SKILLS

- Proficient and accurate in using Microsoft Office suite, including Word, Excel, Access and Power Point;
- Entry level use of Quickbooks;
- Able to use a copier to make multiple collated copies as well as making booklets;

Morgan Shaffer

Objective

- To offer my services to a company that promotes conservation and education

Education

BACHELOR OF SCIENCE | MAY 2020 | UNIVERSITY OF MARY WASHINGTON

- Major: Environmental Science: Natural
- Minor: Environmental Sustainability Biology
- Related coursework: Introduction to GIS, Environmental Geochemistry, Field Methods in EESC & GEOL, Pollution Prevention Planning, Hydrology, Toxicology, Ornithology, Animal Behavior

ASSOCIATES | MAY 2017 | RAPPAHANNOCK COMMUNITY COLLEGE

- Major: General Arts & Sciences

Skills & Abilities

COMPUTER SKILLS

- Excellent experience using Word, PowerPoint, Excel, Publisher, and the online Google equivalents
- Good understanding of Skype, Zoom, Webinar, Google Hangouts, and online application Trello
- Experienced in GIS map building, general data analysis, and graphical analysis
- Competent in research using the internet and online databases/libraries
- Quick to learn new programs and technologies

CONSERVATION

- Led and participated in State Park conservation programs such as beekeeping, monarch butterfly raising and tracking, implementing pollinator gardens, and collecting wildflower seeds
- Cared and handled animal ambassadors such as a corn snake, eastern king snake, red-eared sliders, and saltwater fish
- Informed the general public, school groups, and day-care groups about local flora and fauna
- Inspired creativity and critical thinking in children and adults of all ages regarding environmental problems by using hands-on outdoor activities

VISITOR EXPERIENCE & CUSTOMER SERVICE

- First point of contact greeting clients and answering phone calls
- Enriched the experience of 200 – 300 park guests daily through programs, point-duty, and roving
- Performed 2-4 20min-1h long programs daily on a wide variety of subjects, tailoring topics to fit the needs and interests of park guests
- Assisted in providing information, answering questions, taking pictures, and finding resources for guests
- Established a safe environment where the public felt comfortable asking a wide range of questions Assisted in activities directly targeting 4H groups, YMCA, YCC, homeschool groups, and summer school groups
- Adapted all programming and guest interactions to follow Covid guidelines

TEAMWORK

- Basic management such as scheduling other individuals and delegating tasks while taking into account strengths, weaknesses, and time available
- Shared responsibilities with coworkers, willing to take on additional work when coworkers needed extra support
- Capable of taking initiative and handling independent duties

Experience

DATA ENTRY SPECIALIST | POTOMAC RIVER FISHERIES COMMISSION | JULY 2022 - PRESENT

- First point of contact between PRFC and the public via in person, phone, or electronic communication
- Data entry and management of fishery related data to fulfill the agency's mission to conserve and improve the valuable fishery resources of the tidal Potomac River
- Handled daily front office financial transactions and bank deposits

DATA ENTRY INTERN | POTOMAC RIVER FISHERIES COMMISSION | FEBRUARY 2022 – JULY 2022

- Data entry and management of fishery related data
- Responsible for the daily upkeep and organization of harvest records
- Answering phone calls and taking messages for coworkers
- Analysis of data tables and catching anomalies/mistakes

INTERPRETIVE PARK RANGER | WESTMORELAND STATE PARK | MARCH 2021 – JANUARY 2022

- Supervisor of 1 other park staff and 2 AmeriCorps volunteers; in charge of fairly delegating tasks between coworkers and ensuring they submitted necessary data promptly
- Organized all park programming and the creation of fliers promoting weekly program guides
- Promoted Westmoreland State Park and offered educational programs at local events such as First Friday in Montross and the Fall Festival in Montross

- Created, revised, and transcribed educational park programs including 6 new programs
 - Adapted all programming and guest interactions to follow Covid guidelines
 - Enriched the experience of 3,000 – 5,000 guests during the summer months
- INTERPRETIVE PARK RANGER | WESTMORELAND STATE PARK | MAY 2019 – JULY 2020
- Trained AmeriCorps volunteers
 - Led guided tours and activities for park guests daily, teaching topics involving environmental and biological information
 - Cared for permanent and temporary ambassador animals such as snakes, lizards, and frogs
 - Planned, participated, and volunteered for yearly park events including races and family events

RESUME
Raymond (Ray) Draper

SUMMARY

More than 45 years of providing technical guidance and leadership for numerous people over a variety of computer systems and projects.

EXPERIENCE

Potomac River Fisheries Commission / Consultant, Independent Contractor (April 1993 –

Present) Produced multiple database programs in support of daily operations provided by the PRFC staff. Duties included understanding the requirements, designing the database, operator interfaces, and reports.

Provided hardware support for the first ten years. Supported the transition from the old to the new facility. Provide ad-hoc consulting regarding new technology and capabilities. Provide as-needed support to the staff regarding special requests and system modifications.

Enterprise Resource Planning Supervisor & Time Management Instructor (January 2012 – November 2020) *Contractor/Consultant/Employee – depending on the company who won the follow-on contracts:*

- Primarily responsible for conducting the Instructor Led Training (ILT) that is required for personnel to perform their duties as a Supervisor, Time Keeper, and/or Time Approver.
- Developed specific Step-by-Step guides for trained personnel to use as a refresher after the ILT.
- Modified Navy produced classroom material to be specific to personnel at NSWC Dahlgren.
- Presented ERP seminars to the Government population (general users) on how to use the new ERP system who did not require ILT.
- Developed Step-by-Step guides in PDF format and a parallel video (MP4) version for the general users.
- Designed and taught Knowledge Transfer (KT) sessions on specific, user requested topics related to the Time functionality, such as how to obtain names and quantity of employees working overtime or on a telework status.
- Provide follow-up support via phone, on-site, or on-line as needed.

Naval Surface Warfare Center, Dahlgren Division (September 1984 – December 2011) *Civil Service employee assigned to various technical and managerial positions on multiple Navy projects:*

- Special Systems Intelligence & Surveillance Branch Head (2008 – 2011): Provided technical and personnel leadership to several intelligence, surveillance and reconnaissance (ISR) projects. These projects included approximately 45 personnel and twenty million dollars.
- Classified Project Software / Project Lead (2002 – 2008): Established and lead a team of software and hardware engineers, technicians, and support personnel with the development of

an intelligence

collection and data fusion system. Responsible for the requirements, design, development, documentation, installation, and training.

- Cooperative Engagement Capability Software Lead (1996 – 2002): Provided technical software oversight to the lead contractors (Raytheon and Lockheed-Martin) for the Government Program Office. Lead local team with software builds, metrics, and installation aboard ships and land sites.
- Cryptologic Systems Embedded Trainer Software Lead (1993 – 1996): Provided technical software oversight to the lead contractor (Electronic Warfare Associates) for the Government Program Office. Facilitated system and design requirements and conducted acceptance testing at the contractor’s facility.
- Combat Direction Finder Software Independent Verification Lead (1989 – 1993): Provided technical software oversight to the lead contractor (Raytheon-Sanders) for the Government Program Office and conducted Independent Verification & Validation for initial systems.
- Computer Aided Design & Drafting System Software Developer / Site Lead (1984 – 1989): Developed local applications to improve efficiency with system management (printing, plotting, and data storage). Provided project leadership to cross-functional team and training across the Center.

United States Air Force (June 1974 – June 1980) *Telecommunications Specialist:*

Provided technical analysis and repair to long-haul communication systems, which included HF, VHF, landline, and tropospheric systems. Maintained cryptologic equipment and conducted training on systems to co-workers and members of the US Marine Corp during combat exercises.

EDUCATION

Embry-Riddle Aeronautical University (September 1980 – September 1984)

- BS Computer Science
- AS Aviation Management
- Commercial Pilot’s License
- Flight Instructor



J. BLAIR PARSONS III, PMP, CISSP, ITIL4

Chief Information Officer (CIO)

PROFILE

Blair Parsons is a partner and CIO of Talent & Technical Solutions Corporation (TTSC). He has been an IT industry leader for the last 16 years where he has served in various senior leadership roles, including: Activity Command Information Officer (ACIO), Senior IT Program Manager (PM), Senior Software Engineer PM, and Senior Information Systems Engineer. Blair is laser focused on continuous process improvement through advanced use of IT systems both on-prem and in the cloud to provide accountability, performance monitoring, process metrics, and advanced reporting. His accomplishments include the design and implementation of a dynamic, workflow based, custom action tracking system at NAVSEA; a custom, Talent Management application across the US Navy; and numerous successful cloud native system migrations and refactoring projects.

CONTACT

PHONE: 540.903.3537

EMAIL: blair@tts-c.com

WEBSITE: www.tts-c.com

PROFESSIONAL HIGHLIGHTS

TTSC – Chief Information Officer (CIO)

Oct 2019 – Current

- ◆ Design and execute the corporate IT solutions business strategy to include identification of solutions and services being offered, targeting of customer markets and outreach to potential clients, development of technology roadmaps and trends assessments, and establishment of partner programs for rapid execution and value maximization.
- ◆ Lead all IT related efforts, including the implementation and deployment of MS365, design and development of the TTSC Assessment Model (OAM), design and development of the tts-c.com corporate home page, and design and development of the PowerBI OAM Dashboard.

Falconwood, Inc – Senior Cloud Engineer (DevSecOps)

Sep 2019 – April 2020

CACI – Senior IT Program Manager (PM) / ACIO

Oct 2017 – Sep 2019

CACI – Developer, Group Lead, Project Manager

July 2004 – Sep 2017

EDUCATION

MASTER OF BUSINESS ADMINISTRATION (2010)

University of Mary Washington ▪ Fredericksburg, VA

MASTER OF MANAGEMENT OF INFORMATION SYSTEMS (2010)

University of Mary Washington ▪ Fredericksburg, VA

BACHELOR OF SCIENCE IN COMPUTER SCIENCE (2004)

University of Mary Washington ▪ Fredericksburg, VA

CERTIFICATIONS

PROJECT MANAGEMENT PROFESSIONAL

(PMP) (2016)

Project Management Institute (PMI) ▪ ACTIVE



CERTIFIED INFORMATION SYSTEMS SECURITY

PROFESSIONAL (CISSP) (2016)

International Information System Security

Certification Consortium (ISC)² ▪ ACTIVE



ITIL 4 FOUNDATION (2020)

ITIL ▪ ACTIVE



ACIO Funding Proposal, Electronic High-level reporting for the IAW Commercial Fisheries Sector

Bold Comments indicate sections that help with the ranking process

Highlighted text indicates changes from the first submission

Ranking Guide – Maintenance Projects:

Project Quality Factors	Point Range	Description of Ranking Consideration
Multi-Partner/Regional impact including broad applications	0 – 5	Rank based on the number of Partners involved in project OR regional scope of proposal (e.g. geographic range of the stock).
> yr 2 contains funding transition plan and/or justification for continuance	0 – 4	Rank based on defined funding transition plan away from Program funding or viable justification for continued Program funding.
In-kind contribution	0 – 4	1 = 1% - 25% 2 = 26% - 50% 3 = 51% - 75% 4 = 76% - 99%
Improvement in data quality/quantity/timeliness	0 – 4	1 = Maintain minimum level of needed data collections 4 = Improvements in data collection reflecting 100% of related module as defined within the Program design. Metadata is provided and defined within proposal if applicable.
Potential secondary module as a by-product (In program priority order)	0 – 3 0 – 3 0 – 3 0 – 1	Ranked based on <u>single</u> additional module data collection and level of collection as defined within the Program design of individual module.
Impact on stock assessment	0 – 3	Rank based on the level of data collection that leads to new or greatly improved stock assessments.

Other Factors	Point Range	Description of Ranking Consideration
Properly Prepared	-1 – 1	Meets requirements as specified in funding decision document Step 2b and Guidelines
Merit	0 – 3	Ranked based on subjective worthiness

Ranking Guide – Maintenance Projects: (to be used only if funding available exceeds total Maintenance funding requested)

Ranking Factors	Point Range	Description of Ranking Consideration
Achieved Goals	0 – 3	Proposal indicates project has consistently met previous set goals. Current proposal provides project goals and if applicable, intermediate metrics to achieve overall achieved goals.
Data Delivery Plan	0 – 2	Ranked based if a data delivery plan to Program is supplied and defined within the proposal.
Level of Funding	-1 – 1	-1 = Increased funding from previous year 0 = Maintained funding from previous year 1 = Decreased funding from previous year
Properly Prepared	-1 – 1	-1 = Not properly prepared 1 = Properly prepared
Merit	0 – 3	Ranked based on subjective worthiness

Ranking Guide – New Projects:

Primary Program Priority	Point Range	Description of Ranking Consideration
Catch and Effort	0 – 10	Rank based on range within module and level of sampling defined under Program design. When considering biological, bycatch or recreational funding, rank according priority matrices.
Biological Sampling	0 – 10	
Bycatch/Species Interactions	0 – 6	
Social and Economic	0 – 4	
Data Delivery Plan	+ 2	Additional points if a data delivery plan to Program is supplied and defined within the proposal.



ROY COOPER
Governor

ELIZABETH S. BISER
Secretary

KATHY B. RAWLS
Director

July 29, 2022

Atlantic Coastal Cooperative Statistics Program
Operation and Advisory Committee
1050 N. Highland Street, Suite 200A-N
Arlington, VA 22201

To Whom it May Concern,

We are pleased to submit the proposal entitled “**FY23: North Carolina biological database enhancements for the transmission of data to the ACCSP**” for consideration for funding in FY2023.

This maintenance proposal is being submitted to fund a developer for NCDMF’s Biological Database (BDB) upgrade. When the FY2021 proposal titled “*North Carolina biological database enhancements to prepare for transmission of data to the ACCSP*” was submitted, NCDMF was fully staffed and the BDB had 100% support of existing processes so that the contractor hired on this grant as well as the NCDMF IT developer could focus 100% on the new database and its enhancements.

Just before the start of the FY21 project, the BDB Administrator that supported the existing system retired leaving a huge vacancy causing the IT developer to shift to supporting the existing system instead of new development. Hiring of the contractor on the FY21 grant was delayed due to the funding not being available to the North Carolina Department of Information Technology (NCDIT) to start the hiring process; however, a contractor was finally hired in November 2021. Due to several other hiring issues, a qualified replacement BDB Administrator couldn’t be hired until January 2022. These personnel changes were not expected at the time of the previous grant submission and have set work on this project back considerably. A no-cost extension has been submitted for the FY21 grant to continue development.

The scope of this project hasn’t changed but has been narrowed in the attached proposal to reflect design decisions that were made during the current FY21 grant work such as moving forward with a SQL Server database instead of maintaining the existing ASCII 128-byte database. The ASCII version of the BDB has been migrated to SQL Server and is still being finalized. Delays on the web-based interface for data entry and editing will not delay the start of the funded FY2022 grant that will be starting July 2022, titled “*North Carolina fishery-dependent biological data transmissions to the Atlantic Coastal Cooperative Statistics Program Data Warehouse*”.

Thank you for your consideration.

Sincerely,

Stephanie McInerney

Proposal for Funding made to:

Atlantic Coastal Cooperative Statistics Program
Operations and Advisory Committees
1050 N. Highland Street, Suite 200 A-N
Arlington, VA 22204

FY23: North Carolina biological database enhancements for the transmission of data to the ACCSP

Submitted by:

Stephanie McInerny
North Carolina Division of Marine Fisheries
3441 Arendell Street; P.O. Box 769
Morehead City, NC 28557
stephanie.mcinerny@ncdenr.gov

Applicant Name: North Carolina Division of Marine Fisheries

Project Title: FY23: North Carolina biological database enhancements for the transmission of data to the ACCSP

Project Type: Maintenance

Principal Investigator: Stephanie McInerny
NCDMF Information Technology Section Chief

Requested Award Amount: \$146,981

Requested Award Period: For one year, beginning after the receipt of funds.

Original Date Submitted: June 10, 2022

Revised Date Submitted: July 29, 2022

Objective

To enhance the biological database used by the North Carolina Division of Marine Fisheries (NCDMF) to ensure continued use and maintenance of the database on State authorized equipment and to facilitate transmissions of fishery-dependent biological data to the Atlantic Coastal Cooperative Statistics Program (ACCSP) Data Warehouse.

Background/Need

The development of a comprehensive database to house field sampling collections for the NCDMF was initiated in May 1980 and incorporates data from the 1960s to present. Data are collected from both fishery-dependent and fishery-independent surveys and used in stock assessments and fishery management plans (FMPs) to manage species important to the state as well as those managed by regional and federal management commissions and councils.

Biological data collected are stored in the NCDMF Biological Database (BDB) which consists of a hierarchical set of 128-byte ASCII records that detail various data collected by the sampling programs conducted by the division. The BDB currently consists of nine record types:

- Record Type 1 - Environmental Data
- Record Type 8 - Fishing Gear Data
- Record Type H - Free Format Header Data
- Record Type 2 - Replicate Data
- Record Type R - Free Format Replicate Data
- Record Type 3 - Species Data
- Record Type 4 - Individual Fish Data
- Record Type 5 - Individual Fish Age Data
- Record Type 9 - Individual Fish Tag Recapture Data

For each biological program, data are typically entered onto biological program data sheets according to set protocols contained in each program's written standard operating procedures (i.e., program documentation). While the data field names on the BDB record are rigorously controlled, the type of data collected in a biological program for a given field may vary dependent upon what information the respective biologist is capturing. Data elements that are required and standard across all programs include the following: collection id (sequence number), program id, date, location, gear, replicate id, species id, species status, and the number of individuals. Specific programs may also record in addition several other data elements such as station number, duration of sample, sediment type, depth, air temperature, dissolved oxygen, pH, weather, current speed, additional data on individuals collected (weight, age, tag number, annulus measurements), etc. The BDB structure allows each program to capture the data elements needed in a flexible and organized manner with like codes and other standards, but no single program captures all the data defined in the BDB record types. Consequently, biological program data elements vary from program to program. This leads to many variations in the biological data or "coding" sheet. At this moment, there are over 125 different coding sheets defined; but, this number could change at any time dependent on new or changing program documentation requirements.

Currently, there are data from over 120 programs within the BDB and 18 million records. This includes both fishery-dependent and fishery-independent data types. These data are important to the management of species in North Carolina as well as regional and federal species. The primary method for data entry into the BDB can only run on a Windows XP machine; therefore, it has been cumbersome to maintain the BDB as built since computer operating systems used by the state upgraded from Windows XP. The

need to enhance the BDB and its data entry interfaces has been increasing over time but there is an immediate need to address database structure, data entry tools, and create a plan for improved user extraction tools as North Carolina State security guidelines currently prohibit PCs not using Windows 10 or newer to be on the state network. This adds an additional level of difficulty in maintaining the BDB and a strong reason for upgrading the database and input/output (I/O) interfaces. In addition, data entry and regular maintenance on the BDB cannot be done via remote access. With the ongoing COVID-19 pandemic, teleworking has been required in some cases and is likely to be maintained in some form moving forward.

The NCDMF has been an active participant in transferring selected BDB program data to other regional databases. Two fishery-independent surveys are provided to the Southeast Assessment Monitoring Program (SEAMAP) which is a cooperative program to facilitate the management, and dissemination of fishery-independent data from the waters of the southeastern United States. North Carolina fishery-dependent biological data from the snapper-grouper fishery is provided to the NOAA Fisheries Southeast Fisheries Science Center's Trip Information Program (TIP) which is a major component of the ACCSP. With the upgrades outlined in this proposal, NCDMF will be prepared for future transmissions of data to the ACCSP Data Warehouse to meet the goals and standards of data sharing initiatives between North Carolina and ACCSP. Other than snapper-grouper data, biological data collected by North Carolina are not currently available in the Data Warehouse.

This maintenance proposal is being submitted to fund a developer for NCDMF's Biological Database (BDB) upgrade. When the FY2021 proposal titled "*North Carolina biological database enhancements to prepare for transmission of data to the ACCSP*" was submitted, NCDMF was fully staffed and the BDB had 100% support of existing processes so that the contractor hired on this grant as well as the North Carolina Department of Information Technology (NCDIT) developer located at NCDMF could focus 100% on the new database and its enhancements. Just before the start of the FY21 project, the BDB Administrator that supported the existing system retired leaving a huge vacancy, causing the NCDMF IT developer to shift to supporting the existing system instead of new development. Hiring of the contractor on the FY21 grant was delayed due to the funding not being available to the NCDIT to start the hiring process; however, a contractor was finally hired in November 2021. Due to several other hiring issues, a qualified replacement BDB Administrator couldn't be hired until January 2022. These personnel changes were not expected at the time of the previous grant submission and have set work on this project back considerably. A no-cost extension has been filed for the FY21 grant to continue development.

The scope of this project hasn't changed but has been narrowed to reflect design decisions that were made during the current FY21 grant work such as moving forward with a SQL Server database instead of maintaining the existing ASCII 128-byte database. The scope of this project remains modernizing NCDMF's BDB. Delays on the web-based interface for data entry and editing will not delay the start of the funded FY2022 grant that will be starting July 2022, titled "*North Carolina fishery-dependent biological data transmissions to the Atlantic Coastal Cooperative Statistics Program Data Warehouse*".

Review of Previous Results:

Scripts have been created to migrate the ASCII flat file database into a SQL Server database. The format of the SQL Server database is close to finalized and is synced to the ASCII database daily to help facilitate verification of data between the two databases. Development on a new web-based interface has been started and several ways to view and export data from the SQL database have been created based on previously available functionality that uses the ASCII database. Biologists are verifying accuracy of the data format and results from the new interface. Reference tables have been created and added to the SQL

database to allow for additional formatting of the data. The ability to edit records has begun on Record Types 1 and 2 records and program-specific business rules are starting to be included in this process. The FY21 grant is currently ongoing.

Approach

NCDMF staff continually work with NCDIT staff on a requirements document to detail specific needs and expectations of the corresponding I/O interfaces. This document will be fluid and will be updated as decisions are made. Minor changes occur as data inconsistent with known documentation are discovered. In the final database, data will still be flagged as dependent or independent based on the biological sampling program they were collected from to differentiate between these data types so that only fishery-dependent data are transferred to ACCSP. The web-based interface development will continue under this proposed grant to facilitate data entry as well as data corrections that can be used on Windows 10 PCs. With this new modernized interface, continued maintenance of the BDB will be easier as standard upgrades to operating systems occur over time. The SQL database also offers greater flexibility to meet new data requirements that were more difficult to implement under the ASCII database format. New data verification methods will be implemented in the web-based interface with corresponding database elements to track progress through the verification process. NCDMF staff will work with NCDIT staff to complete this project. Several NCDIT staff are housed at the NCDMF Headquarters office in Morehead City, NC and will be overseeing, assisting, and facilitating this project as well as actively developing new functionality for the interface. A contractor will be hired to help complete the interface development.

The new SQL Server database and the BDB's new web-based interface will allow for frequent transfers of fishery-dependent program data from the NCDMF to the ACCSP. These transfers could also replace the need for yearly transfers of biological data from North Carolina to the TIP program by providing necessary TIP variables within the ACCSP data transmission. Those data could be retrieved by the SEFSC from the ACCSP Data Warehouse, as needed. Once the ACCSP transfer process is built and refined, the data could be transmitted monthly which will significantly improve timeliness of NC data to TIP compared to the annual transfer that happens currently. The scope of the funded FY22 grant is specifically the portal for this data transmission and the SQL scripts to compile the data for transfer. Some work to get the data into the TIP database from ACCSP may be required and is not funded under the FY22 project.

NCDIT at NCDMF has been using the Agile SCRUM methodology for software development over the last 8-10 years. Development of the BDB web-based application will also be conducted using Agile development and 3-week development Sprints. User stories to define "bite-sized" pieces of functionality from the requirements document will be created to guide the development process.

Results and Benefits

Successful fulfillment of this project will provide:

- Enhanced data entry and verification functionality for North Carolina biological program data
- Increased timeliness and cleanliness of North Carolina's biological data
- Remote access to the BDB by staff that maintain the database, as well as biologists
- The ability for the BDB to meet State security requirements
- Data that can be easily formatted to facilitate transmissions of fishery-dependent biological data from North Carolina to the ACCSP Data Warehouse which will be accessible by regional partners including SEFSC TIP staff, as needed

Geographic Location

The NCDMF Headquarters are located in Morehead City, North Carolina. This project may be performed remotely and does not require the position to be located in Morehead City. Other NCDIT contractors working for the division are located in Raleigh, North Carolina.

Data Delivery Plan

Documentation of the enhanced data entry and editing process as well as any metadata and database schema changes will be provided to ACCSP as part of the annual report. The NCDMF BDB has extensive documentation for each of the sampling programs that are stored in the database. New documentation on the enhanced database will include data mapping tables that provide a definition of each variable with respect to the old database to ensure data migration is successful and accurate. Any new stored procedures created during this project will include documentation on primary function, data tables being accessed, and corresponding variables within the procedure’s SQL code.

Biological data will be submitted to ACCSP through the data transmission portal outlined in the FY2022 grant titled “North Carolina biological data transmissions to the Atlantic Coastal Cooperative Statistics Program Data Warehouse” that is set to begin in July 2022.

Completed Data Delivery to ACCSP

The FY2021 project is still ongoing and performance reports have been submitted as required. The annual report for FY21 is not yet due to ACCSP.

Milestone Schedule (start date depending on time of grant award):

Task	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
Hire Contractor	X	X										
Develop requirements document	X	X	X	X	X	X	X	X	X	X	X	X
Create user stories	X	X	X	X	X	X	X	X	X	X	X	X
Interfaces for data entry and verification will be built and tested.	X	X	X	X	X	X	X	X	X	X	X	X
Finalize documentation											X	X

The contractor is expected to work 40 hours a week on this project. Report writing will follow the requirements of two semi-annual status reports and a final report due at the end of the grant award.

Project Accomplishments Measurement (Metrics and Achieved Goals)

Projects	Accomplishments
Update requirements document, as needed throughout project	<ul style="list-style-type: none"> • Document is completed and describes functionality that needs to be completed in new application
User stories are created for Agile Development	<ul style="list-style-type: none"> • User stories are written and document small tasks for developers to complete requirements within Sprints
Create interface for data entry	<ul style="list-style-type: none"> • Process completed and fully documented • Data are able to be entered into biological database
Create interface for data verification/editing	<ul style="list-style-type: none"> • Process completed and fully documented • QA/QC tests can be run on data • Data are able to be viewed and edited
Finalize documentation	<ul style="list-style-type: none"> • Documentation reflects new enhanced process and data structure

Project Personnel

Stephanie McInerny—Section Chief, NCDMF IT Section (NCDIT)

Casey Knight—Biological User Group (BUG) Chair, NCDMF

Vacant—BUG Co-Chair, NCDMF

Chris Capoccia—Applications Systems Analyst II, NCDMF IT Section (NCDIT)

Scott Smith—Biological Database Administrator, NCDMF IT Section (NCDIT)

Phyllis Howard—Biological Database Clerk, NCDMF IT Section (NCDIT)

Leslie Hester— Biological Database Clerk, NCDMF IT Section (NCDIT)

Funding Transition Plan

This project should be completed within the proposed 1-year grant period. NCDIT and NCDMF staff can maintain the systems developed from this grant; therefore, subsequent years of funding are not needed.

FY23 Budget Narrative

The cost summary table below shows an explanation for each budget item for a one-year period. NCDIT will not charge an indirect fee for the Contractor. The cost for the developer in the summary below is based on an expert level .NET developer from NCDIT’s convenience contracts. This rate is what the current contractor is making and is largely different from the rate estimated in last year’s proposal which was the standard rate for a developer that specializes in Microsoft Dynamics CRM (a customer relationship management software package that NCDIT has been using to replace other legacy systems

within the state). CRM was not chosen as the solution for the Biological Database upgrade; therefore, the developer costs have been reduced from \$100 per hour to \$68.26 per hour.

In-kind amounts have increased compared to the previous year’s proposal as the NCDIT developer and BDB Administrator have been committed to completing this upgrade and new interface; however, they are still responsible for maintaining the existing system until the upgrade is completed so only 8 months of their time is dedicated to new development.

FY23 Cost Summary

Category	Expense	Units	Cost	ACCSP Request	State In-Kind	Explanation
Personnel	Contractor	1	\$141,981	\$141,981		One Analyst @ \$68.26/hr for 2,080 hrs (1 year)
	IT Section Chief	1			\$37,876	\$9,469/month for 4 months
	NCDIT Application Systems Analyst	1			\$56,440	\$7,055/month for 8 months
	NCDMF BUG Chairs	2			\$19,744	Average salary of \$4,936/month for 4 months (2 months each)
	NCDMF BDB Administrator	1			\$48,064	\$6,008/month for 8 months
	NCDMF BDB clerk	2			\$12,296	\$3,074/month for 4 months (2 months each)
Subtotal				\$141,981	<u>\$174,420</u>	
Fringe	Retirement, Social Security, Health Insurance				\$59,440	Fringe=24.19% of salary (\$42,192) plus \$7,397/year for health insurance (1 month insurance = \$616*28 months combined work=\$17,248)
Indirect						No indirect needed for NCDIT contractors
Subtotal				\$0	<u>\$59,440</u>	
Travel				\$3,500		Travel for PI to present upgraded interface and functionality at conference
Subtotal				\$3,500	\$0	
Supplies	Computer	1	\$1,500	\$1,500		Replacement laptop for contractor, if needed
Subtotal				\$1,500	\$0	
	Column Totals			\$146,981	<u>\$233,860</u>	Total project cost = \$380,841
	Total Request					
	Percent			39%	61%	Percentage calculated from total cost

Attachment 1: Budget Narrative and Cost Summary for previously funded project (FY2021)

FY21 Budget Narrative

The cost summary table below shows an explanation for each budget item for a one-year period. NCDIT will not charge an indirect fee for the Contractor.

NCDIT has convenience contracts in place that can be used to fill the budgeted position in this proposal; therefore, if money is awarded, a job posting will be sent to the temporary agencies used by NCDIT to solicit for applicants. Qualified individuals will be interviewed to select the best candidate for the position. A formal RFP will not be needed to hire a contractor for this project.

The cost for the developer in the summary below is based on the standard rate for a developer that specializes in Microsoft Dynamics CRM which is a customer relationship management software package that NCDIT has been using to replace other legacy systems within the state. If CRM is not the chosen solution for this project, the cost for the developer may be less.

FY21 Cost Summary

Category	Expense	Units	Cost	ACCSP Request	State In-Kind	Explanation
Personnel	Contractor	1	\$150,000	\$150,000		One Analyst @ \$100.00/hr for 1,500 hrs (9 months)
	IT Section Chief	1			\$26,250	\$8,750/month for 3 months
	NCDIT Application Systems Analyst	1			\$22,800	\$5,700/month for 4 months
	NCDMF District Manager	2			\$24,000	Average salary of \$6,000/month for 4 months (2 months each)
	NCDMF BDB Administrator	1			\$20,772	\$5,193/month for 4 months
	NCDMF BDB clerk	2			\$11,364	\$2,841/month for 4 months (2 months each)
Subtotal				\$150,000	\$105,186	
Fringe	Retirement, Social Security, Health Insurance				\$41,125	Fringe=29.09% of salary (\$30,599) plus \$6,647/year for health insurance (1 month insurance = \$554*19 months combined work=\$10,526)
Indirect						No indirect needed
Subtotal				\$0	\$41,125	

Travel				\$1,000		Travel for contractor between work location and Morehead City HQ office for in-person meetings, as needed
Subtotal				\$1,000	\$0	
Supplies	Computer	1	\$2,500	\$2,500		
	External Hard Drive	1	\$100	\$100		
Subtotal				\$2,600	\$0	
	Column Totals			\$153,600	<u>\$146,311</u>	Total project cost = \$299,911
	Total Request					
	Percent			51%	49%	Percentage calculated from total cost

Attachment 2: Project History and Total Project Cost by Year

YEAR	TITLE	COST	RESULTS
2021	<i>North Carolina biological database enhancements to prepare for transmission of data to the ACCSP</i>	\$153,600	Project currently underway; SQL database created, design decisions made for web-based interface, development started on web-based interface for viewing and editing data

Summary of Proposal for Ranking Purposes

Proposal Type: *Maintenance*

Program Priority

Catch and Effort: 0%

Biological Sampling: 100%

The North Carolina Biological Database (BDB) was developed in 1980 to house field sampling data from fishery-dependent and fishery-independent sampling programs. The database contains data from the 1960s to present. There are data from over 120 programs within the BDB and 18 million records. These data are used in stock assessments and fishery management plans to manage species important to the North Carolina as well as those managed by regional and federal management commissions and councils. (see pages 3, 4)

Bycatch/Species Interactions: 0%

Social and Economic: 0%

Metadata:

The NCDMF BDB has extensive documentation for each of the sampling programs that are stored in the database. New documentation on the enhanced database will include data mapping tables that provide a definition of each variable with respect to the old database to ensure data migration is successful and accurate. Any new stored procedures created during this project will include documentation on primary function, data tables being accessed, and corresponding variables within the procedure's SQL code. Documentation will be provided as part of the grant completion report. (see pages 3-6)

Project Quality Factors

Multi-Partner/Regional impact including broad applications:

Although this project only covers data for North Carolina, future transmissions of biological data to the ACCSP will benefit other partners as the data will be more readily available for data requests and stock assessments. Many species within North Carolina are managed regionally. Regional management agencies such as the Atlantic States Marine Fisheries Commission (ASMFC) and Mid-Atlantic Fishery Management Council (MAFMC) would benefit from having more access to these fishery-dependent data. (see pages 3, 4)

Contains funding transition plan and/or justification for continuance:

The goals defined in this project should be completed within the grant cycle. (see page 7)

In-kind contribution:

61% (see cost table on page 8)

Improvement in data quality/quantity/timeliness:

The project identified in this proposal will greatly improve data quality and timeliness by providing a more modernized format for the data with enhanced data entry/verification screens and workflows that will prepare North Carolina for transmitting data to the Data Warehouse. (see page 5)

Potential secondary module as a by-product:

None

Impact on stock assessment:

Although this project only covers data for North Carolina, future transmissions of biological data to the ACCSP will benefit other partners as the data will be more readily available for data requests and stock assessments. Many species within North Carolina are managed regionally. Regional management agencies such as the Atlantic States Marine Fisheries Commission (ASMFC) and Mid-Atlantic Fishery Management Council (MAFMC) would benefit from having more access to these fishery-dependent data. (see pages 3, 4)

Properly Prepared:

This proposal follows the guidelines provided in the ACCSP Funding Decision Document.

Merit:

Modernizing NCDMF's Biological Database and the front-end interfaces that allow data entry clerks, technicians, biologists, and analysts to interact with the database is crucial to the success of biological data sampling programs in North Carolina. Failures to the interfaces that interact with the ASCII database are regularly occurring which result in excessive IT time to fix and excessive wait times for biologists and technicians that need to use the data for stock assessments and fishery management plans.

Stephanie McInerny

North Carolina Division of Marine Fisheries/North Carolina Department of Information Technology
3441 Arendell Street / P.O. Box 769
Morehead City, NC 28557
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stephanie.mcinerny@ncdenr.gov

EXPERIENCE

Information Technology Section Chief (Applications Systems Manager I) March 2020–Current **North Carolina Department of Information Technology (NCDIT), Morehead City, NC**

Supervisory and Management

- Manage 15 technical staff members of IT Section at NCDMF through the North Carolina Department of Information Technology.
- Directly supervise seven employees to include assigning and reviewing tasks, coaching, mentoring, performance reviews, encouraging enhancement of skills, time management, and hiring.
- Manage six different budgets including budgets that fund NCDMF biological staff
- Currently, overseeing several IT projects occurring simultaneously requiring daily multi-tasking, prioritization of staff and resources, planning, meetings, and organization.
- Oversee and manage applications development, biological database, and GIS staff and activities

License and Statistics Section Chief (Environmental Program Manager I) 2016–2020 **North Carolina Division of Marine Fisheries (NCDMF), Morehead City, NC**

Supervisory and Management

- Manage around 60 staff members of the License and Statistics Section including office and field staff located in five different offices throughout NC. Had roles in time management, coaching, mentoring, hiring, firing, disciplinary action, performance reviews, encouragement of skills, and training.
- Directly supervise seven employees to include assigning and reviewing tasks, coaching, mentoring, performance reviews, encouraging enhancement of skills, time management, and hiring.
- Manage 20 different budgets including budgets that fund Information Technology (IT) staff and projects. Monies consist of appropriations, receipts, and federal grants totaling over \$3 million.
- Responsible for presenting at quarterly Marine Fisheries Commission meetings on license, commercial, and recreational data issues requiring effective communication of complex statistics and data collection programs.
- Currently, overseeing several IT projects occurring simultaneously requiring daily multi-tasking, prioritization of staff and resources, planning, meetings, and organization. Current projects using either Waterfall or Agile application development are listed below:

Agile development projects:

- **NCDMF Fisheries Information Network (FIN) replacement project using Agile SCRUM**
- **NCDMF FIN-GIS for shellfish leases and pound nets** (2 similar projects)

Waterfall development projects:

- **NCDMF-ACCSP upload portal interface upgrade and improvement project**
- **NCDMF Coastal Angling Program Catch U Later project** (i.e., mobile discard reporting for recreational fishermen focused on flounder)
- **NCDMF Trip Ticket Program VESL project** (web software for seafood dealer reporting)

Data, Statistics, and Committees

- SQL Server Database Schema Design – actively review and comment on schema changes to the FIN Database proposed by developers to improve and simplify data capture and in particular, data analysis by analysts at DMF
- Perform daily data queries of FIN using SAS and SQL (through SQL Management Studio)
- Frequently querying FIN for data related to section programs, license sales, and commercial trip ticket data using SAS, SQL, R, and Crystal Reports
- Serve on the DMF Management Review Team (MRT)
- Serve on Atlantic Coastal Cooperative Statistics Program (ACCSP) Operations Committee
- Serve on ACCSP Commercial Technical committee and ACCSP Information Systems committee
- Serve as Chair of the FIN Software Change Control Board and member of IT Steering Committee.
- Serve on Coastal Recreational Fishing License (CRFL) Joint Review Team

- Serve on Rules Advisory Team (RAT) as well as several RAT subcommittees (Permit NOV subcommittee, Periodic Review Subcommittee, Shellfish Workgroup)

Trip Ticket Data Analyst (Marine Fisheries Biologist II)

2008–2016

North Carolina Division of Marine Fisheries (NCDMF), Morehead City, NC

IT Project Management and Documentation

- Created, led, and managed multiple IT software development projects using Waterfall. Was responsible for drafting scopes of work, database schema review, drafting data specification documents, requirements gathering, review of architectural solutions suggested by DMF IT, communication between IT and business users, prioritizing projects and budget, coordinating resources, and testing. Projects are listed below:
 - **Trip Ticket Data Upload Interface**
 - **ACCSP Automated Update**
 - **Simplification of E-Dealer data importing**
 - **Electronic Import of Quota Monitoring Data**
 - **ACCSP Upload Interface** - Principal Investigator
- Acted as Business Architect and Product Owner for NCDMF during Pega FIN replacement project
- Served as Chair of the FIN Software Change Control Board and member of IT Steering Committee.
- Wrote and/or compiled standard operating procedures and policies for the NCDMF eel monitoring program, NCDMF Biological Database extraction and analysis, and ACCSP data transmission process as well as FIN data entry procedures for Marine Patrol violation data and several Habitat and Enhancement section permits.

Data Analysis, Statistics, and Committees

- Was the primary data analyst for the NCDMF Trip Ticket Program. Performed daily commercial fishery data queries and statistical analyses using programming languages such as SAS, SQL, Microsoft Office Products (e.g., Excel and Access), and R (statistical analysis software) including weight-length regressions, nonlinear growth models, length and age compositions, CV, natural mortality, and landings trends.
- Analyzed data from the DMF Biological Database, when needed and trained staff on extraction and analysis.
- Participated as a member of plan development teams that facilitate fishery management plans for species important to North Carolina.
- Provided commercial data, analyzed life history data, wrote technical reports, and give presentations at data workshops for Southeast Data Assessment and Review (SEDAR) stock assessments for NOAA Fisheries and the Atlantic States Marine Fisheries Commission (ASMFC) as part of the life history and commercial workgroups.
- Accessed, verified, and performed quality control on ACCSP, NOAA, and NCDMF fisheries data for NC using SAS, SQL, Oracle SQL Developer, Microsoft SQL Management Studio, Crystal Reports, and R.
- Involved in training, coaching, and mentoring new and existing employees on procedures and policies of the Trip Ticket Program and SAS programming as well as counseling and mediating conflicts between staff to maintain a team environment.
- Served on the NCDMF Biological Review Team (BRT), BRT Technical Committee, BRT Biological User Group, BRT Life History Subcommittee, and BRT Editorial Subcommittee.
- Served on CRFL Joint Review Team
- Served on ACCSP Committees including Commercial Technical, Information Systems, Outreach, and Conversion Factor Subcommittee.
- Involved in interviewing over 30 applicants for a variety of NCDMF positions as well as evaluating, recruiting, selecting candidates, and hiring for positions within License and Statistics Section, Fisheries Management Section, and Protected Resources Section.

EDUCATION

July 2007	University of North Carolina Wilmington	Wilmington, NC
	M.S., Marine Biology with Applied Statistics Certificate	
Fall 2006	North Carolina State University	Raleigh, NC
	Post Baccalaureate Studies – Quantitative Fisheries Management	
December 2002	East Carolina University	Greenville, NC
	B.S., Biology/Marine Biology	

**Proposal for funding made to the
Atlantic Coastal Cooperative Statistics Program
1050 N. Highland Street, Suite 200A-N
Arlington, VA 22201**

**FY23: Pilot Observer Program for Rhode Island State Waters Gillnet
Fishery**

Total Cost: \$118,519.58

Submitted By:
Nicole Lengyel Costa
Rhode Island Department of Environmental Management
Division of Marine Fisheries
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JA Macfarlan
Rhode Island Department of Environmental Management
Division of Marine Fisheries
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Reuben.Macfarlan@dem.ri.gov

Applicant Name: Rhode Island Department of Environmental Management
Division of Marine Fisheries

Project Title: Pilot Observer Program for Rhode Island State Waters Gillnet Fishery

Project Type: New Project

Requested Award Amount: \$118,519.58

Requested Award Period: One year after receipt of funds (April 2023 to April 2024)

Program Priority: Primary: bycatch (80%)
Secondary: catch and effort (20%)

Date Submitted: August 16, 2023

Project Supervisor: Julia Livermore, Deputy Chief, Julia.livermore@dem.ri.gov

Principal Investigator: Nicole Lengyel Costa, Principal Biologist, nicole.lengyel@dem.ri.gov

Project Staff: JA Macfarlan, Principal Biologist, Reuben.Macfarlan@dem.ri.gov
Fisheries Specialist
Seasonal Interns

Bold comments intended to help with ranking

Atlantic Coastal Cooperative Statistics Program (ACCSP) Proposal for the State of Rhode Island

Objectives:

- Implement a pilot **observer program** within RI state waters for the **gillnet** fishery.
- Collect **discard data on important target species including Atlantic menhaden (*Brevoortia tyrannus*), striped bass (*Morone saxatilis*), bluefish (*Pomatomus saltatrix*), black sea bass (*Centropristis striata*), summer flounder (*Paralichthys dentatus*), winter skate (*Leucoraja ocellata*), little skate (*Leucoraja erinacea*), and spiny dogfish (*Squalus acanthias*).** Discard data will be collected on additional species as time allows.
- **Collect effort data to characterize the fishing behavior of the Rhode Island gillnet fishery.** Data reported by gillnet fishers on commercial catch and effort logbooks will be validated by collecting effort data while at-sea including gear code, gear quantity, number of hauls, and days fished. Additional effort data currently not reported by commercial fishers will be collected including mesh size, number of panels per string, haul time, depth, and area fished (latitude/longitude).
- Analyze data collected and conduct modeling to investigate the utility of weekly aggregate limits in reducing discards, the potential for increased effort for active gillnet fishers, the size distribution of discarded target species, and the seasonality of pulse fisheries.
- Evaluate the feasibility and value of a Rhode Island state waters observer program for all commercial gear types by conducting a pilot observer program for the Rhode Island state waters gillnet fishery.

Need:

In recent years, the RI Department of Environmental Management (RIDEM) Division of Marine Fisheries (DMF) has seen a dramatic increase in the number of requested regulatory changes submitted by commercial fishers to improve the efficiency and profitability of their fishing operations and decrease bycatch and regulatory discards. Some of these requests include implementing weekly aggregate possession limits for quota-managed species currently managed with daily limits, lifting the gillnet prohibition for the harvest and possession of striped bass in state waters, and increasing our weekly possession limits seasonally for pulse fisheries such as bluefish. While the DMF has worked with the commercial fishing industry to vet proposals such as these through our public rulemaking process, these proposals have not been adopted due to the lack of data available. Before the DMF could consider adopting such proposals, data collection on fishing behavior, effort, bycatch, and regulatory discards in state waters fisheries is necessary. These data would aid the DMF in better characterizing the potential impacts of these proposed regulatory changes, should they be adopted.

Developing a state waters observer program for all commercial fisheries in the state of Rhode Island would be a costly, time-intensive endeavor that would also require hiring several additional staff members. As such, the DMF is proposing to conduct a pilot observer program for the state waters gillnet fleet to test the feasibility of an observer program while also developing sampling protocols and training materials. **Upon completion of this pilot program, the DMF would work to scope out a state waters observer program for all RI commercial fisheries and fund this work under an alternate source of funding that has already been identified (e.g., Recovering America's Wildlife Act (RAWA)).**

Results and Benefits:

The **data collected on effort, bycatch and regulatory discards in the Rhode Island state waters gillnet fleet** will be used by DMF staff to model the potential impacts of proposed regulatory changes submitted by the commercial fishing industry. By modeling the potential impacts of these proposals, RI stakeholders, the Rhode Island Marine Fisheries Council (RIMFC), and the RIDEM will have a better understanding of any associated risks and will be able to make more informed decisions on which proposals to recommend for adoption. Additionally, conducting this pilot scale observer program on the RI state waters gillnet fleet will provide the DMF with an opportunity to test the feasibility of conducting such a program and allow for the development of sampling protocols and training materials to be used.

Although the geographical scope of this proposal is confined to Rhode Island state waters, the collection of this data will be of great value to many ACCSP partners and species-specific stock assessments. **The Rhode Island gillnet fleet is part of the New England Extra-Large-Mesh Gillnet Fleet and New England Gillnet Fleet, both in the top quartile of the FY23 Bycatch Matrix contained in the ACCSP Request for Proposals (RFP). Several of our target species are also contained in the top quartile of the FY23 Biological Matrix contained in the ACCSP RFP including black sea bass, Atlantic menhaden, winter skate, and spiny dogfish. Although striped bass and bluefish are not in the top quartile of the Biological Matrix, the following are research needs or recommendations from species-specific management documents that this proposal addresses:**

- **Amendment 7 to the Interstate Management Plan for Atlantic Striped Bass states in section 3.7 – Bycatch Data Collection Program (ASMFC, 2022):**
 - **States should collect data from commercial fisheries on the number of fish being discarded from commercial gears that either target or encounter striped bass by implementing at-sea observer coverage.**
 - **States with commercial fisheries should implement observer coverage in state waters on 2-5% of trips.**
- **Amendment 2 to the Bluefish Fishery Management Plan states in section 6.2 – Research and Data Needs (ASMFC, 2021):**
 - **The stock assessment assumption of zero discards in the commercial fishery should be investigated.**

Data Delivery Plan: Data will be submitted to ACCSP as soon as a platform for submitting bycatch and discard data is made available to state partners. Data will be made available to any state partner upon request and will be submitted for inclusion in individual species stock assessments during the benchmark stock assessment process.

Approach:

The following outlines the approach that DMF staff will take to complete the proposed work regarding personnel, outreach, data collection, and analysis.

Personnel:

The DMF will contract a full-time Fisheries Specialist I who will work out of the DMF offices in Jamestown, RI. The employee will go through the following:

- Standard DMF onboarding process

Bold comments intended to help with ranking

- At-sea vessel safety training
- Species identification training
- Fisheries data collection and data entry training
- Training on the RI gillnet fleet participants, frequently landed species, and fishing practices

The employee will be provided with foul weather gear, a laptop computer, and supplies necessary to conduct at-sea data collection.

Outreach:

Prior to the submission of this proposal, DMF staff reached out to several gillnet fishers who fish in state waters to inform them of our plans for this pilot project and get their feedback. The fishers who were contacted were all supportive of the project and happy to see the DMF take steps towards a more comprehensive state waters observer program. As a result, we do not anticipate any challenges in gaining participation and achieving our sampling targets.

The DMF will dedicate a page on our website to the project, discuss the proposed project at our finfish regulatory workshops in 2022 and early 2023, and present an overview of the project to our RIMFC. Upon notification that funding has been approved for this project, DMF staff will send a letter to all fishers who reported fishing gillnets in 2022 to inform them about the pilot project. DMF staff will reach out to each fisher individually to inquire if they plan on fishing in state waters, federal waters, or both. **Any fishers who plan to fish exclusively in federal waters will be removed from the pool of fishers. This will ensure there is no overlap between our pilot observer program and the federal waters observer program.** For reference, 16 commercial fishers reported using gillnets in 2021.

Data Collection:

Data will be collected for this project from May 2023 through October 2023. A target of **5% sampling coverage per week will be used to determine the number of trips sampled each week, using data from 2022 as a proxy. The value of 5% was chosen as Amendment 7 to the Atlantic Striped Bass Interstate Fishery Management Plan recommended sampling 2 – 5% of trips, the DMF chose the higher threshold. Additionally, the ACCSP Atlantic Coast Fisheries Data Collection Standards (2012) document defines adequate sampling as 2 – 5 % observer coverage (ACCSP, 2012).** Analysis of 2021 data indicates that the number of required trips per week will range from 1 – 3. Each licensed fisher will be assigned a random number and on Friday of each week, DMF staff will use a random draw to select 1 – 3 fishers for the following week. These fishers will be contacted on Friday and notified that they have been selected to have a trip observed for the following week. DMF will remain in close communication with these fishers the following week to coordinate trips and ensure that the required number of trips are completed. Should it be determined that a fisher will not be fishing at all in a selected week, an alternate fisher will be selected.

Prior to April 2023, several DMF staff members, along with the Fisheries Specialist I, will complete training exercises with a few selected fishers to gain practice on board the vessels, and determine the time available for data collection so that sampling protocols can be developed. Sampling protocols will be similar to those utilized by the Northeast Fisheries Observer Program (NEFOP) where detailed information will be collected for each haul and **individual weights and lengths will be collected for all target species to the extent practical and for non-target species as time allows.** Sub-sampling procedures will be used for high-volume catches and notes will be made regarding the condition of discarded fish (i.e., dead, alive, unknown).

Analysis:

Bold comments intended to help with ranking

All data collected at-sea will be entered into an MS Access database by DMF staff. The statistical software R, ArcGIS, and MS Excel will be used for all data analysis. The following details the analyses that will be performed to address specific regulatory proposals.

Striped bass gillnet prohibition

Trip and haul data including time of year, depth, mesh size, gear quantity, and area will be explored as factors affecting the catchability of striped bass in gillnets. Length frequency data of striped bass will be used to determine how many legal and sub-legal sized striped bass are encountered on each trip. These data will be used to determine if lifting of the striped bass gillnet prohibition will increase dead discards, increase quota utilization rates, or increase effort. Area, seasonal, and gear restrictions will be explored as potential tools to limit potential impacts.

Possession limits for target species

Regulatory discards of target species on each trip will be analyzed and extrapolated to estimate total landed catch and discards of each target species for each week. Modeling simulations will be performed to test the effect of weekly aggregate limits on effort and discards for species currently managed with daily possession limits (i.e., to determine if weekly aggregate limits would significantly reduce effort and regulatory discards). Simulations will also be performed to determine if increasing weekly possession limits for pulse fisheries such as bluefish would decrease effort and discards.

Geographic Location: This project will be conducted by RIDEM DMF staff out of Jamestown, RI. At-sea sampling will occur on vessels fishing with commercial gillnets in Rhode Island state waters.

Milestone Schedule:

Table 1. Milestone Schedule.

Activity	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
Industry outreach	X	X										
Hire Fisheries Specialist I	X											
Conduct trainings		X										
Develop training materials		X	X	X								
Conduct at-sea sampling			X	X	X	X	X	X	X	X		
Analyze data										X	X	X
Report writing										X	X	X

Project Accomplishments Measurement:

Table 2. Project Accomplishment Metrics.

Goal	Metric
Safety training	Vessel safety course completed
Training materials	PDF document of protocols
At-sea sampling	5 % weekly trip coverage
Data analysis	Analysis and modeling in R and ArcGIS
Report writing	Report submitted to ACCSP

Bold comments intended to help with ranking

Cost Summary (Budget):
 Table 3. Project Summary Budget

PERSONNEL:

Item	ACCSP Share	Direct State Share	Total
Deputy Chief (FTE 5%)	\$0.00	\$7,706.45	\$7,706.45
Principal Biologist (FTE 5%)	\$0.00	\$6,395.20	\$6,395.20
Principal Biologist (FTE 15%)	\$19,558.95	\$0.00	\$19,558.95
Fisheries Specialist (Contractor 100%)	\$77,807.00	\$0.00	\$77,807.00
Seasonal Intern (RIDEM 10%)	\$0.00	\$1,200.00	\$1,200.00
Indirect Charges (ASMFC Contractor 15%)	\$11,671.05	\$0.00	\$11,671.05
Indirect Charges (RIDEM FTE 18.5%)	\$3,618.41	\$2,830.81	\$6,449.22
TOTAL PERSONNEL	\$112,655.41	\$18,132.46	\$130,787.87

EQUIPMENT & SUPPLY

Item	ACCSP Share	Direct State Share	Total
US Maritime Resources Center Training Course	\$1,515.00	\$0	\$1,515.00
Grundens Boots	\$129.99	\$0	\$129.99
Grundens Hekules Bibs	\$159.99	\$0	\$159.99
Gloves (10 pair)	\$69.90	\$0	\$69.90
Grundens Neptune Pullover	\$99.99	\$0	\$99.99
Fish basket (3)	\$74.97	\$0	\$74.97
Ketch 32" Fish Board	\$38.99	\$0	\$38.99
Rite in the Rain Paper	\$120.00	\$0	\$120.00
Bench Scale	\$1,500.00	\$0	\$1,500.00
Dell Laptop computer	\$1,100.00	\$0	\$1,100.00
TOTAL SUPPLY	\$4,808.83	\$0.00	\$4,808.83

TRAVEL

Item	ACCSP Share	Direct State Share	Total
Mileage (41 trips @ 44 miles roundtrip @ \$0.585/mile)	\$1,055.34	\$0	\$1,055.34

TOTAL

Item	ACCSP Share	Direct State Share	Total
Total Direct Charges	\$118,519.58	\$18,132.46	\$136,652.04
Percentage	87%	13%	

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COST DETAILS:

Description of budget categories and expenses for this project

Overall match: RIDEM is providing 13% of services as in-kind contribution.

- a. **Personnel:** The DMF project team has several staff members working in a collaborative effort to accomplish project objectives. Each staff member will spend a percentage of their time on the project as follows:

From ACCSP:

- i. **Principal Biologist:** 15% funded position to act as the principal investigator and may conduct initial observer trips; 15% of salary (\$89,128) and fringe benefits (\$41,265) for one year = \$19,558.95.
- ii. **Fisheries Specialist:** 100% funded position (contracted through ASMFC) to serve as the primary fisheries observer; 100% of salary (\$57,105) and fringe benefits (\$20,702) for one year = \$77,807.

From RIDEM as In-kind:

- i. **Deputy Chief:** 5% funded to provide project oversight and staff management; 5% salary (\$100,436) and fringe benefits (\$53,693) for one year = \$7,706.45.
- ii. **Principal Biologist:** 5% funded position to act as support to the principal investigator and provide assistance on field work as needed; 5% salary (\$77,548) and fringe benefits (\$50,356) for one year = \$6,395.20.
- iii. **Intern:** 10% funded seasonal intern to assist with data entry. Approximately 10% of six-month salary = \$1,200.

Fringe benefits

Annual fringe benefits rates for all employees include the following:

Retirement 24%
Deferred Compensation 0.4%
FICA 6.2%
Medicare 1.45%
Health care \$21,937/year
Dental \$1,132/year
Vision \$165/year
Assessed Fringe 4.25%
Retiree Health 6.75%

- Total annual fringe benefits for the Deputy Chief are \$53,693. Fringe benefits for 5% of their time are \$2,684.65
- Total annual fringe benefits for the Principal Biologist (project PI) are \$41,265. Fringe benefits for 15% of their time are \$6,189.75.
- Total annual fringe benefits for the additional Principal Biologist are \$50,356. Fringe benefits for 5% of their time are \$2,517.80.

Bold comments intended to help with ranking

Indirect

The RIDEM indirect rate for FY23 is 18.5%. The ASMFC indirect rate for the contracted employee is 15%

From ACCSP:

- i. **Principal Biologist:** 18.5% of the 15% (\$19,558.95) is \$3,618.41 per year.
- ii. **Fisheries Specialist:** 15% of the 100% funded position (\$77,807) contracted through ASMFC is \$11,671.05 per year.

From RIDEM as In-kind:

- i. **Deputy Chief:** 18.5% of the 5% funded position (\$7,706.45) is \$1,425.69 per year.
 - ii. **Principal Biologist:** 18.5% of the 5% funded position (\$6,395.20) is \$1,183.11 per year.
 - iii. **Intern:** 18.5% of the 10% funded seasonal intern (\$1,200) is \$222.00 per year.
- b. **Equipment & Supply:** Equipment and supplies for this grant will be for the Fisheries Specialist to conduct at-sea sampling on-board commercial fishing vessels. Supplies include at-sea vessel safety training, a set of foul gear (bibs, pullover, boots, gloves), fish baskets, measuring board, bench scale, Rite in the Rain paper, and a laptop computer.
- c. **Travel:** Travel for this grant includes mileage to travel roundtrip from the DMF Office located in Jamestown, RI to the Port of Galilee in Narragansett, RI. The ASMFC mileage rate of \$0.585/mile was used to travel 44 miles roundtrip with a total of 41 trips. A total of 41 trips was calculated based on 5% weekly coverage using 2021 data as a proxy.

SUMMARY OF PROPOSAL FOR RANKING

Proposal Type: New

Primary Program Priority: Bycatch/Species Interactions (80%)

- Bycatch and regulatory discard data (number, length, weight) will be collected from the Rhode Island gillnet fleet on important target species including Atlantic menhaden, striped bass, bluefish, black sea bass, summer flounder, winter skate, little skate, and spiny dogfish. Data will be collected on additional species as time allows.
- The Rhode Island gillnet fleet is part of the New England Extra-Large-Mesh Gillnet Fleet and New England Gillnet Fleet, both in the top quartile of the FY23 Bycatch Matrix contained in the ACCSP Request for Proposals (RFP).
- Several of our target species including black sea bass, Atlantic menhaden, winter skate, and spiny dogfish are in the top quartile of the FY23 Biological Matrix contained in the ACCSP RFP.

Data Delivery Plan: Data will be submitted to ACCSP as soon as a platform for submitting bycatch and discard data is made available to state partners. Data will be made available to any state partner upon request and will be submitted for inclusion in individual species stock assessments during the benchmark stock assessment process.

Multi-Partner/Regional Impact: Although the geographical scope of this proposal is confined to Rhode Island state waters, the collection of this data will be of great value to many ACCSP partners and species-specific stock assessments.

- Amendment 7 to the Interstate Management Plan for Atlantic Striped Bass states in section 3.7 – Bycatch Data Collection Program (ASMFC, 2022):
 - States should collect data from commercial fisheries on the number of fish being discarded from commercial gears that either target or encounter striped bass by implementing at-sea observer coverage.
 - States with commercial fisheries should implement observer coverage in state waters on 2-5% of trips.
- Amendment 2 to the Bluefish Fishery Management Plan states in section 6.2 – Research and Data Needs (ASMFC, 2021):
 - The stock assessment assumption of zero discards in the commercial fishery should be investigated.

Contains Funding Transition Plan: This is a pilot project that will be used to test the feasibility of a Rhode Island state waters observer program for all commercial gear types. This pilot project may warrant several years of data collection and therefore Rhode Island anticipates submitting this proposal for funding as a new project for one year, and up to but not exceeding, two additional years as a maintenance project. At the completion of this pilot project, Rhode Island will evaluate the feasibility of a full-scale state waters observer program and plans to apply for funding from an alternate source to fund the project moving forward (e.g., Recovering America's Wildlife Act (RAWA)).

In-Kind Contribution: In-kind contribution for this project is 13% as stated in the budget table.

Bold comments intended to help with ranking

Improvement in Data Quality/Quantity/Timeliness: This project will collect data that addresses priorities in the FY23 Bycatch and Biological Matrices. Additionally, data collected will address several research recommendations identified in species-specific management documents.

Potential Secondary Module: Catch and Effort (20%)

- Effort data will be collected to characterize the fishing behavior of the Rhode Island gillnet fishery.
- Data reported by gillnet fishers on commercial catch and effort logbooks will be validated by collecting effort data including gear code, gear quantity, number of hauls, and days fished.
- Additional effort data currently not reported by commercial fishers will be collected including mesh size, number of panels per string, haul time, depth, and area fished (latitude/longitude).

Impact on Stock Assessment: Data collected as part of this project will address questions regarding the quantity and size distribution of commercial discards occurring the New England gillnet fleet. Information on commercial discards remains limited for many stock assessments and in some cases is assumed to be zero but has not been validated in state waters.

Innovative: This project is innovative in that it is attempting to test the feasibility of a state waters observer program. In federal waters, NEFOP collects essential data on bycatch and regulatory discards but fishing operations occurring in state waters are not part of this effort. This project will not only test the feasibility of having such a program in state waters, but it will fill large data gaps identified in several stock assessments and lay the groundwork for other ACCSP partners who may wish to implement a similar program.

Properly Prepared: This proposal meets the requirements as specified in the Funding Decision Document.

Merit: This project will sample from a fleet in the FY23 Bycatch Matrix, will collect data from several species in the FY23 Biological matrix, and will satisfy several species-specific research recommendations.

LITERATURE CITED:

Atlantic Coastal Cooperative Statistics Program. (2012). *Atlantic Coast Fisheries Data Collection Standards*.

Atlantic States Marine Fisheries Commission. (2021). *Amendment 2 to the Interstate Fishery Management Plan for Bluefish*.
https://www.asmfc.org/uploads/file/61b39d5aBluefishAmendment2_Aug2021.pdf

Atlantic States Marine Fisheries Commission. (2022). *Amendment 7 to the Interstate Fishery Management Plan for Atlantic Striped Bass*.

Appendix A: Curriculum Vitae for Principal Investigator

Nicole Lengyel Costa

nicole.lengyel@dem.ri.gov

401-423-1940

PROFESSIONAL EXPERIENCE

RI Department of Environmental Management, Jamestown, RI, 05/10/09 – Present

Principal Biologist (Marine)

Duties:

- Principal Investigator (PI) for the finfish age and growth study responsible for overseeing the program and staff including a principal biologist, a fisheries technician, and seasonal interns
- PI for the Narragansett Bay Atlantic Menhaden monitoring survey responsible for management of the commercial menhaden fishery within RI state waters
- Write grant narratives and create grant budgets for marine fisheries projects and programs
- Review grant proposals and rank proposals to receive federal funding through Atlantic Coastal Cooperative Statistics Program (ACCSP) and NOAA Fisheries
- Former lead on offshore renewable energy projects. Played a vital role in all aspects of the RI Ocean SAMP and the permitting and construction of the Block Island Wind Farm
- Support Deputy Chief on matters pertaining to the New England Fishery Management Council (NEFMC) small mesh multispecies (whiting) plan
- Current Membership on various technical committees/panels: Atlantic States Marine Fisheries Commission (ASMFC) Striped Bass Technical Committee (TC) (former chair), ASMFC Striped Bass Plan Development Team (PDT), ASMFC Striped Bass Plan Review Team (PRT), ASMFC Menhaden PRT, ASMFC Menhaden PDT, ASMFC Ageing committee, ASMFC Northeast Area Monitoring and Assessment Program (NEAMAP) Operations committee (chair), ASMFC Bluefish TC, ASMFC Bluefish PRT, Mid-Atlantic Fishery Management Council (MAFMC) Bluefish monitoring committee (MC), ACCSP Operations committee (chair), ACCSP Biological Review Panel (former chair), ACCSP Bycatch Prioritization committee (former chair), NEFMC Whiting PDT
- Previous Membership on various technical committees/panels: ASMFC Weakfish TC, ASMFC Bluefish Benchmark Stock Assessment Working Group, ASMFC Artificial Reefs committee, NOAA Fisheries Red hake Stock Structure Working Group
- Participate in benchmark stock assessments and stock assessment updates including complex analysis and/or modeling, and writing of technical/scientific reports for peer-review
- Previously in charge of RI quota monitoring tracking via SAFIS dealer reports and RI seafood dealer compliance tracking including creation of an automated process through the statistical software R
- Prepare and submit annual fishery compliance reports
- Present annual reports including fisheries data and analytical results to Rhode Island stakeholders (RIDEM public workshops) and Board members at ASMFC Board Meetings
- Marine Fisheries information management team leader in charge of promulgation of RI marine fisheries regulations and all storage/IT related issues including running public meetings in-person and virtually
- Serve as professional reviewer for peer-reviewed journal articles as requested

Skills developed: 15 years of Marine Fisheries experience working for the state of Rhode Island, Strong teamwork and leadership skills as chair of many committees; Experience in giving public presentations

Bold comments intended to help with ranking

and fielding questions; Supervisory experience though overseeing age and growth project staff and seasonal interns as well as training new staff; Fisheries Management experience by attending and participating in ASMFC Board meetings, ASMFC and ACCSP technical committees and panels, RI promulgation of regulations process, and Rhode Island Marine Fisheries Council (RIMFC) meetings; Computer and statistical skills (R, SPSS, Microsoft software, ASAP, NOAA Fisheries Toolbox); Field work experience on a variety of fisheries surveys.

University of Rhode Island Graduate School of Oceanography, Narragansett, RI, Feb. 2004 – 05/09/09
Laboratory Technician/Marine Research Assistant I

Duties:

- Managed all aspects of the benthic ecology laboratory including analyzing Naturalist dredge samples and bottom photos taken on annual benthic habitat surveys
- Managed study database using MS Excel and Access; Performed statistical analysis of Naturalist dredge data
- Supervised, trained, and delegated tasks to undergraduate student help
- Performed genetic analyses on colonial ascidian tissue samples including DNA extraction, primer design, polymerase chain reaction (PCR), PCR clean-up, gel electrophoresis, and DNA sequence analysis

Scientist: Georges Bank Benthic Habitat Survey

Duties:

- Participated in and helped organize four benthic habitat research cruises spanning 10-14 days on board NOAA fisheries research vessels (R/V Delaware II and FSV Henry B. Bigelow).

RI Department of Environmental Management, Providence, RI, June 2005 -August 2005

Seasonal Policy Intern

Duties:

- Participated in many aspects of the Greenwich Bay restoration project; Daily tasks included: gathered tax parcel data for restoration sites; managed data in MS excel; created project maps in Arcmap; performed field site investigations

EDUCATION

University of Rhode Island, Kingston, RI

PhD candidate, Marine Affairs

University of Rhode Island, Graduate School of Oceanography, Narragansett, RI

Master of Science Degree, Biological Oceanography - May 2013

University of Rhode Island, Kingston, RI

Bachelor of Science Degree, Biological Sciences - December 2005

The School for Field Studies (Boston University), Queensland, Australia

Rainforest Studies – September 2004 – December 2004

Bold comments intended to help with ranking

Proposal for Funding made to:

Atlantic Coastal Cooperative Statistics Program
Operations and Advisory Committees
1050 N. Highland Street, Suite 200 A-N
Arlington, VA 22204

North Carolina socioeconomic database construction for the management of existing and future data

Submitted by:

Jason Walsh
North Carolina Division of Marine Fisheries
3441 Arendell Street; P.O. Box 769
Morehead City, NC 28557
jason.walsh@ncdenr.gov

Applicant Name: North Carolina Division of Marine Fisheries

Project Title: North Carolina socioeconomic database construction for the management of current and future data

Project Type: New Project

Principal Investigator: Jason Walsh
NCDMF Fisheries Economics Program Manager

Requested Award Amount: \$145,020

Requested Award Period: For one year, beginning after the receipt of funds.

Original Date Submitted: August 5, 2022

Objective

To build a consolidated socioeconomic database to be used by the North Carolina Division of Marine Fisheries (NCDMF) to organize existing data for easier analysis and standardize future data entry and storage, as well as facilitate transmissions of fishery-dependent socioeconomic data to the Atlantic Coastal Cooperative Statistics Program (ACCSP) Data Warehouse.

Background/Need

North Carolina's fisheries are a significant social and economic resource to the state and its communities. The North Carolina Division of Marine Fisheries (NCDMF) works to better understand and predict the impact these fisheries have both on their communities and on the state's economy. The North Carolina Fisheries Economics Program (NCFEP) has a wide range of surveys that they use to monitor economic performance over time.

NCDMF has been collecting socioeconomic information on commercial and recreational fishing in North Carolina for more than two decades. The NCFEP collects data on all stakeholders in commercial and recreational fisheries to better understand the role fisheries play in the state of North Carolina. Due to the diversity of stakeholder groups in fisheries the data collected varies between surveys and between years as surveys are continuously updated to summarize contributions. The variables that are often collected include but are not limited to the following: demographic information, gear used, species targeted, expenditure and/or costs associated with business, income, fishing history, and perceptions and awareness of regulations. These data are collected to better understanding coastal communities that rely on the fishing industries, recreational and commercial fishermen, and the impact of all fishing industries on the State's economy through intra and interstate commerce.

The program administers surveys to stakeholders to monitor species-specific and broad fishery performance to achieve the goals of the Division. The data collected through these surveys are considered sensitive and confidential information about fishermen and dealers in North Carolina but are currently stored on a NCDMF network drive that is open to every employee within the License and Statistics Section. These data are collected and stored in Microsoft Excel or Microsoft Access formats in organized folders with corresponding metadata in Microsoft Excel or Microsoft Word documents according to standard operating procedures written by the NCFEP. Given the diversity and structure of datasets there has not been a centralized location for data to be stored. This leads to data being disorganized, difficult to work with and challenging to identify trends which is pertinent to the goal of identifying fishery economic performance and participation over time. Consolidation of these data into a database will also allow for increased protection and organization to ensure data are handled appropriately.

Some surveys are newly created every year, while other surveys are updated about every five years. In the last few years, there has been a delay in data collection due to the COVID-19 pandemic and staff turnover. To better accommodate future variability, a centralized location for data will allow for less delay and better organization and structure of resources to adequately collect, structure, and share data across management bodies.

Approach

NCDMF staff will work with NCDIT staff on a requirements document to detail specific needs and expectations of the new data structure and corresponding input/output (I/O) interface. This document will be fluid and will be updated as decisions are made.

All data will be consolidated into a relational database within SQL Server. This database will be able to interact with the NCDMF FIN database where the commercial license data are stored as well as access to the Wildlife Resources Commission ALVIN database where the recreational license data are stored.

A web-based application will be built to serve as the front-end interface for data entry and modification. NCDMF staff will work with NCDIT staff to complete this project. Several NCDIT staff are housed at the NCDMF Headquarters office in Morehead City, NC and will be overseeing, assisting, and facilitating this project as well as helping with database development. A contractor will be hired to complete the interface development.

The new SQL Server database and web-based interface will allow for consolidation of NCFEP data for optimized use by the NCDMF to meet fishery management goals. Once the data are consolidated, a file can be submitted to ACCSP for use by other state partners and in regional fishery management plans such as Black Sea Bass, Bluefin Tuna, American Shad, Cobia, and other commercially and recreationally targeted species in North Carolina.

NCDIT at NCDMF has been using the Agile SCRUM methodology for software development over the last 8-10 years. Development of the database and interface referenced in this proposal will also be conducted using Agile development and 3-week development Sprints. User stories to define “bite-sized” pieces of functionality from the requirements document will be created to guide the development process.

Results and Benefits

Successful fulfillment of this project will provide:

- Consolidation and standardization of NCDMF’s socioeconomic data
- Data that can be easily formatted to facilitate use of fishery-dependent socioeconomic data by NCDMF staff and other state partners once data are submitted to ACCSP
- Enhanced data entry and verification functionality for North Carolina NCFEP data
- Increased timeliness and cleanliness of North Carolina’s socioeconomic data to state and regional fishery managers and stakeholders

Geographic Location

The NCDMF Headquarters are located in Morehead City, North Carolina. This project may be performed remotely and does not require the position to be located in Morehead City. Other NCDIT contractors working for the Department are located in Raleigh, North Carolina. The current NCFEP manager is located in Kill Devil Hills, NC, which is close to the NCDMF Manteo field office.

Data Delivery Plan

Documentation of the new data entry and editing interface as well as any metadata and the new database schema will be provided to ACCSP as part of the annual report. New documentation on the new database will include data mapping tables that provide a definition of each variable. Any new stored procedures created during this project will include documentation on primary function, data tables being accessed, and corresponding variables within the procedure’s SQL code.

Milestone Schedule (start date depending on time of grant award):

Task	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
Hire Contractor	X	X										
Develop requirements document	X	X	X	X	X	X	X	X	X	X	X	X
Create user stories		X	X	X	X	X	X	X	X	X	X	X
Database will be created			X	X								
Interface for data entry and editing will be built and tested				X	X	X	X	X	X	X	X	X
Finalize documentation											X	X

The contractor is expected to work 40 hours a week on this project. Report writing will follow the requirements of two semi-annual status reports and a final report due at the end of the grant award.

Project Accomplishments Measurement (Metrics and Achieved Goals)

Projects	Accomplishments
Update requirements document, as needed throughout project	<ul style="list-style-type: none"> Document is completed and describes functionality that needs to be completed in new application
User stories are created for Agile Development	<ul style="list-style-type: none"> User stories are written and document small tasks for developers to complete requirements within Sprints
Create database and migrate data	<ul style="list-style-type: none"> Consolidated database was created and accurately contains all socioeconomic data required
Create interface for data entry	<ul style="list-style-type: none"> Process completed and fully documented Data can be entered into the new database

Projects	Accomplishments
Create interface for data verification/editing	<ul style="list-style-type: none"> • Process completed and fully documented • Data can be viewed and edited
Finalize documentation	<ul style="list-style-type: none"> • Documentation reflects new enhanced process and data structure

Project Personnel

Jason Walsh— Fisheries Economics Program Manager, NCDMF License and Statistics Section (NCDEQ)

Stephanie McInerny—Section Chief, NCDMF IT Section (NCDIT)

Brandi Salmon—Section Chief, NCDMF License and Statistics Section (NCDEQ)

Funding Transition Plan

This project should be completed within the proposed 1-year grant period. NCDIT and NCDMF staff can maintain the systems developed from this grant; therefore, subsequent years of funding are not needed.

Budget Narrative

The cost summary table below shows an explanation for each budget item for a one-year period. NCDIT will not charge an indirect fee for the Contractor. The cost for the developer in the summary below is based on an expert level .NET developer from NCDIT’s convenience contracts.

Cost Summary

Category	Expense	Units	Cost	ACCSP Request	State In-Kind	Explanation
Personnel	Contractor	1	\$143,520	\$143,520		One Analyst @ \$69/hr for 2,080 hrs (1 year)
	IT Section Chief	1			\$18,938	\$9,469/month for 2 months
	L&S Section Chief	1			\$11,154	\$5,577/month for 2 months
	Fisheries Economics Program Manager	1			\$28,134	Average salary of \$4,689/month for 6 months
Subtotal				\$143,520	\$58,226	

Category	Expense	Units	Cost	ACCSP Request	State In-Kind	Explanation
Fringe	Retirement, Social Security, Health Insurance				\$20,245	Fringe=24.19% of salary (\$14,085) plus \$7,397/year for health insurance (1 month insurance = \$616*10 months combined work=\$6,160)
Indirect						No indirect needed for NCDMF contractors
Subtotal				\$0	<u>\$20,245</u>	
Supplies	Computer	1	\$1,500	\$1,500		Laptop for contractor, if needed
Subtotal				\$1,500	\$0	
	Column Totals			\$145,020	<u>\$78,471</u>	Total project cost = \$223,491
	Total Request					
	Percent			65%	35%	Percentage calculated from total cost

Summary of Proposal for Ranking Purposes

Proposal Type: *New*

Program Priority

Catch and Effort: 0%

Biological Sampling: 0%

Bycatch/Species Interactions: 0%

Social and Economic: 100%

The NCFEP strives to assess and follow the economic performance of the State's marine resources. This goal includes, but is not limited to, understanding coastal communities that rely on the fishing industries, recreational and commercial fishermen, and the impact of all fishing industries on the State's economy through intra and interstate commerce. The program administers surveys to recreational fishermen, commercial fishermen, processors, and other stakeholders to achieve the goals of the Division. (Page 3,4)

Metadata:

New documentation on the new database will include data mapping tables that provide a definition of each variable. Any new stored procedures created during this project will include documentation on primary function, data tables being accessed, and corresponding variables within the procedure's SQL code. Documentation will be provided as part of the grant completion report. (Page 3)

Project Quality Factors

Multi-Partner/Regional impact including broad applications:

Although this project only covers data for North Carolina, many species within North Carolina are managed regionally. Regional management agencies such as the Atlantic States Marine Fisheries

Commission (ASMFC) and Mid-Atlantic Fishery Management Council (MAFMC) would benefit from having more access to these fishery-dependent socioeconomic data. (Page 3,4)

Contains funding transition plan and/or justification for continuance:

The goals defined in this project should be completed within the grant cycle. (Page 6)

In-kind contribution:

35% (see cost table on Page 6,7)

Improvement in data quality/quantity/timeliness:

The project identified in this proposal will greatly improve data quality and timeliness by providing a more modernized format for the data with enhanced data entry/verification screens and workflows that will prepare North Carolina for future data reference and analysis. (Page 4)

Potential secondary module as a by-product:

None

Impact on stock assessment:

Although this project only covers data for North Carolina, future organization of socioeconomic data will benefit other partners as the data will be more readily available for data requests and stock assessments. Many species within North Carolina are managed regionally. Regional management agencies such as the Atlantic States Marine Fisheries Commission (ASMFC) and Mid-Atlantic Fishery Management Council (MAFMC) would benefit from having more access to these fishery-dependent socioeconomic data. (Page 3,4)

Properly Prepared:

This proposal follows the guidelines provided in the ACCSP Funding Decision Document.

Merit:

Modernizing NCDMF's Socioeconomic Database and the front-end interface that allow data entry clerks and analysts to interact with the database is crucial to the success of socioeconomic data collection programs in North Carolina. (Page 3)

Jason Walsh

Cell:(525)269-9299 Email: Jason.walsh@ncdenr.gov

SUMMARY OF QUALIFICATIONS

EDUCATION

University of Rhode Island **Graduated: 2021**

Master's Graduate Student: Environmental and Natural Resource Economics

University of North Carolina (Wilmington, NC) **Graduated: 2015**

Overall GPA: 3.6; Dean's List

Dual Major: B.S. Environmental Science, B.A. Economics

Nelson Mandela Metropolitan University (Port Elizabeth, South Africa) **January-May 2014**

Moulay Ismail University (Meknes, Morocco) **January-May 2013**

TEACHING EXPERIENCE

Teaching Assistant University of Rhode Island

- Teach an introductory Biology course incorporating statistics and R **August 2016-May 2021**

WORK EXPERIENCE

North Carolina Division of Marine Fisheries Morehead City, North Carolina

- Fisheries economics program manager **January 2022-Present**

McArthur Environmental Consulting Framingham, Massachusetts

- Prepare documents for clients and local municipalities part time **December 2020-December 2021**

Rhode Island Fish and Wildlife Wakefield, Rhode Island

- Field interview marine recreational anglers **July 2017-October 2017**

RESEARCH

Research Assistant (Dr. Todd Guilfoos, Professor of Natural Resource Economics URI) May 2017-May 2021

- 20 Hours/Week
- Creating hedonic studies on the economic effect of dam removals in New England using statistical tools Stata and ArcGIS

Student Trainee (USDA Economic Research Service) **June 2019-August 2019**

- 40 Hours/ Week
- Intern modelling nutrient runoff of farms from the agricultural resource management survey using the environmental policy integrated climate model software.

Research Assistant (Annette Bourbonniere)

September 2018-May 2019

- 10 Hours/ Week
- A team member developing the model and performing analysis using R for a discrete choice study on the effect of removing earnings from insurance and social security payments for persons with spinal chord injuries

Research Consultant (Chris Brozyna)

December 2018-May 2019

- 5 Hours/ Week
- A team member providing assistance during analysis and writing stages of an experimental economics study on TURFS (a rights based fishery management strategy)

Directed Independent Study (Dr. Peter Schuhmann, Professor of Economics at UNCW) July 2015-2016

- Used Contingent valuation methods and regression analysis to assess willingness to pay and willingness to return of tourists to Barbados

Directed Independent Study (Dr. Zachary Long, Professor of Ecology at UNCW) July-December 2014

- Studied macro algae at Fort Fisher recreation area to find how stability of benthic marine communities' consumers is influenced by the presence of invasive macro algae

PUBLICATIONS

TURF Wars: Group Dynamics in Resource Management

October 2019

- Working paper at the Center for Growth and Opportunity on TURF as a fishery management tool.
- <https://www.thecgo.org/wp-content/uploads/2020/04/working-paper-2019.013.pdf>

PRESENTATIONS

AAEA Conference Presentation

August 2018

- Present preliminary results from first chapter of dissertation. A hedonic study on dam removals heterogeneous effect on housing prices.

Guest Lecturer

February 2019 & February 2020

- Present results from first chapter of dissertation in an ecohydrology graduate course. A hedonic study on dam removals heterogeneous effect on housing prices. This also serves as an introduction to environmental economics to the masters of environmental management at URI.

Proposal for funding made to the
Atlantic Coastal Cooperative Statistics Program
1050 N. Highland St. Ste. 200A-N
Arlington, VA 22201

FY23: Data modernization and improvements to the New York Data Feed

Submitted by:

Melissa Albino Hegeman
New York State Department of Environmental Conservation
Division of Marine Resources
123 Kings Park Blvd
Kings Park, NY 11754
melissa.albino@dec.ny.gov

Applicant Name: New York State Department of Environmental Conservation, Division of Marine Resources (DMR)

Project Title: Data modernization and improvements to the New York Data Flow

Project Type: New

Requested Award Amount: \$33,882

Requested Award Period: FY 2023

Objectives:

* Modernize data flow by utilizing the eTrips for Data Entry Staff to allow NYSDEC staff to enter vessel trip reports received on paper directly into SAFIS. Focuses on commercial and party/charter trip level information on catch and effort. Improve the timeliness of providing data to ACCSP. Improve New York's ability to check electronically submitted reports for errors and to fix them within SAFIS.

* Provide new and existing New York commercial fishers with outreach and technical support for electronic reporting on SAFIS eTrips in order to improve the speed at which fisheries data are available in the ACCSP data warehouse for use in New York Quota Management.

* Increase the volume of electronic trip reports received by helping to transition fishers to electronic reporting. The goal is to achieve a 50% electronic reporting rate over the course of three years.

Need: New York State Department of Environmental Conservation (NYSDEC) began requiring trip level catch and effort reporting in 2008. This program collects fisheries-dependent data from all New York licensed dealers and harvesters. All dealers must enter their activities directly into the eDR (electronic dealer report) SAFIS application. However, most New York commercial harvesters' trip reports are submitted on paper (approximately 80% of commercial trip reports). This workflow results in a substantial delay in uploading trip reports in SAFIS. We propose to work with ACCSP directors and staff to help oversee and develop a plan to transition harvesters and

NYSDEC staff to electronic reporting and SAFIS data entry. Three in-house DMR staff will work to coordinate efforts to meet these objectives.

Results and Benefits: Data entry directly into SAFIS by NYSDEC staff will result in substantial improvements in the timeliness of New York's commercial fishing data. Additionally, focusing on increasing direct online reporting by the harvesters will reduce the volume of paper data and save time and paperwork for the fishing industry and for the DMR staff. This project will work to encourage and provide technical support for online reporting.

The objectives will modernize data collection processes through establishing a direct data feed with ACCSP which will make catch and effort data available in a timelier manner. By the end of fiscal year 2023 the data flow will be established, and we aim to see an increase of online reporters through outreach and education efforts.

Data Delivery Plan: Harvester data received by NYSDEC will be entered directly into SAFIS and available immediately to partners. There will be an increased emphasis on moving harvesters away from paper entry forms and into eTrips for required reporting.

Approach: The following outlines the tasks required to complete this project:

Task 1: Establish a direct data flow to SAFIS.

- Identify and execute the necessary changes to eTrips for Data Entry Staff to allow NYSDEC staff to efficiently enter trip reports into SAFIS and make necessary corrections.
- Provide a direct data feed between SAFIS and New York's fisheries databases.
- Identify any additional requirements to ensure that there is no loss in functionality by switching to SAFIS for data entry.
- Automate standard reports such as landings summaries and quota monitoring.
- Provide additional training to NYSDEC staff. Topics may include, but are not limited to, query designs and data integrity.

Task 2: Increase electronic reporting.

- Shift to an electronic-first outreach program. All new license holders will be offered a SAFIS account and training when they receive their license, if they opt-out they will be given paper VTRs.

- Evaluate existing partner eTrips outreach and support plans to gather methodologies that have been successful for other Partners.
- Provide increased live training opportunities, both in-person and virtual.
- Improve electronic reporting content and information on NYSDEC Vessel Trip Reporting website.
- Solicit feedback from harvesters to determine roadblocks to electronic reporting.
- Create additional training content such as videos, handouts, etc.
- Continue to provide technical support for general questions regarding reporting, licensing, permitting, and other topics.
- Provide incentives to harvesters to switch to electronic reporting using promotional items. These items might include insulated tumblers, hats, coolers, etc.
- Create an eTrips ambassador program to target early electronic reporting adopters and provide them with additional training and tools to spread the word to other harvesters.

Task 3: Provide additional training to NYSDEC staff.

- Introductory and advanced data management training covering topics such as SQL query design, best practices in quality control, and data integrity.

Geographic Location: This project will be administered and conducted by NYSDEC offices as well as ACCSP offices. The scope of the project covers all of NY and adjacent state and federal waters fished by NY license holders.

Table 1. Milestone Schedule

Activity	Month														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Establish data feed with ACCSP	X	X	X	X	X	X	X	X	X	X	X	X			
eTrips and eDR support	X	X	X	X	X	X	X	X	X	X	X	X			
Create training content	X	X	X	X	X	X	X	X	X						
Distribute training content				X	X	X	X	X	X	X	X	X			
Report Writing							X						X	X	X

Program Accomplishment Measurement Metrics:

The success of the project will be measured by the following metrics:

- Improved data delivery from NYSDEC to ACCSP.
- Improved quality in data submitted to the ACCSP.
- Provide support to New York license holders to improve data collection and data quality.
- Creation of eTrips training material.

Goal	Metric	Accomplished
Establish data flow to/from ACCSP	Trip level data entered, verified, and properly formatted	Data delivered to ACCSP in a timely manner.
Provide support for eTrips and eDR users	Number of interactions regarding SAFIS questions	Record interactions with a call log
Create training content	Amount of handouts generated and videos created	New content available on NYSDEC website
Distribute training content	Amount of handouts distributed and the number of videos uploaded	Report of content usage
Increase number of eTrips users	Number of new accounts created	Report of new accounts created
NYSDEC staff training	Completed coursework	Demonstrated knowledge of key subjects.

Project Personnel:

- Melissa Albino Hegeman – Unit Leader (Biologist 2), Marine Fisheries Data Management Unit
- Jessica Steve – Biologist 1, Marine Fisheries Data Management Unit
- Alyssa Lefebvre – Biologist Trainee 2, Marine Fisheries Data Management Unit

Funding Transition Plan: This project should be completed within the proposed 1-year period. No transition is needed.

Budget Narrative:

The majority of this project's budget focuses on the creation of outreach tools, the purchase of promotional items, and the cost of mailing these products to license holders. There are also additional funds to train DMR staff to better manage and analyze the fisheries-dependent data and make it available to other programs for use in management decisions.

NYSDEC will provide in-kind staff time to facilitate moving harvesters to electronic reporting, including onboarding new harvesters, developing outreach materials, and hosting training events. This in-kind staff time represents 48% of the total project budget.

Cost Details:

Category	Description		ACCSP Cost	State In-Kind
Personnel	ACCSP Contractor			
	Biologist 2 (1)	10% @ \$85,000/year		\$ 8,500.00
	Biologist 1 (1)	20% @ \$65,000		\$13,000.00
	Biologist Trainee 2 (1)	20% @ 50,000		\$10,000.00
Equipment and Supplies	Outreach documents	Printing outreach materials	\$10,000.00	
	Promotional materials	Hats, tumblers, stickers, etc. for participants	\$10,000.00	
	Postage	mailing out promotional items, outreach documents, etc.	\$ 5,000.00	
Travel	Travel to training sessions	\$0.585/mile * 360 miles		\$ 175.50
Other	NYSDEC staff training	Introductory and advanced training	\$ 5,000.00	
	Subtotal		\$30,000.00	\$31,675.50
	ACCSP Overhead		\$ 3,882.00	
	Subtotal		\$33,882.00	\$31,675.50
	Project Total		\$65,557.50	

Summary of Proposal for Ranking Purposes

Proposal Type: New

Program Priority:

Catch and Effort: 100%

Increasing the timeliness of catch and effort data from New York by increasing the electronic reporting by harvesters and having NYSDEC staff enter paper vessel trip reports directly into SAFIS via the eTrips for Data Entry tool.

Biological Sampling: 0%

Bycatch/Species Interactions: 0%

Social and Economic: 0%

Overview:

We are transitioning harvesters to electronic reporting from paper-based reporting by developing additional training and outreach activities and creating incentive programs for harvesters who choose to report through eTrips.

NYSDEC staff will also enter trip report data directly into SAFIS to make that data available to ACCSP partners immediately.

Multi-Partner/Regional impact including broad applications:

More timely submissions of New York's catch and effort data means this information will be available for data requests and stock assessments for regionally managed species.

Contains funding transition plan and/or justification for continuance:

This project will be completed within the proposed 1-year period. No transition is needed.

In-kind contribution:

48%

ACCSP - \$33,882.00

State In-kind - \$31,675.50

Total - \$65,557.50

Improvement in data quality/quantity/timeliness:

Focusing on increasing electronic reporting from harvesters improves the accuracy and timeliness of vessel trip report data. By entering data directly into SAFIS, New York may take advantage of built-in data validation that will increase the accuracy of the trip data. This workflow will also increase the speed at which New York catch and effort data are available to ACCSP partners.

Potential secondary module as a by-product:

None

Impact on stock assessment:

This project focuses on improving New York data; however, this data is crucial to assess species that are managed regionally properly. Making this data available for analysis is vital for accurate stock assessments.

Properly Prepared:

This proposal follows the guidelines provided in the ACCSP Funding Decision Document.

Merit:

This project addresses required trip reporting for commercial harvesters in New York.

Melissa Albino Hegeman

Phone: 518-369-0570 • Email: melissa.hegeman@gmail.com • Homepage: <https://www.melissahegeman.com>

I am a marine biologist and geospatial analyst with 15+ years of experience. I am interested in fisheries management, marine spatial planning, and sustainability.

Professional Experience

Marine Fisheries Data Management Unit Leader
New York State Department of Environmental Conservation
Kings Park, NY

August 2019–Present

- Supervise a staff of six to collect, organize, process, store, and analyze New York's commercial and party/charter fisheries data. Maintenance of fishery data from vessel trip reports and dealer purchase forms to ensure that fishers and dealers are complying with required reporting schedules.
- Maintain and enhance the Commercial Marine Fisheries System which includes building and maintaining a SQL Server database, providing accurate and detailed data to partner agencies, analyzing the data, and providing reports to answer current fisheries management questions.
- Provide effective communication between the Marine Fisheries Data Management office, licensed fishers and dealers, stakeholders, staff, and other agencies.
- Represent New York on several interstate committees within the Atlantic Coastal Cooperative Statistics Program, including the Operations Committee and the Standards and Codes Committee.
- Provide guidance and expertise to other units in Marine Resources regarding data management and analysis.
- Work with all programs in the Division of Marine Resources to help them organize and manage their data resources, specifically focusing on geospatial data (including developing and maintaining web feature services).
- Create and maintain web mapping applications for both internal and external users on the ArcGIS Online platform using ArcMap to manage the feature services (such as the Artificial Reef Mapper and the Public Shellfish Mapper).
- Lead Marine Resources participation in agency-wide activities such as the Field Inspection Tools program, and DECinfo Locator focusing on the collection and analysis of geospatial data.

Marine Permit Supervisor
New York State Department of Environmental Conservation
East Setauket, NY

April 2018–August 2019

- Oversee the operation of the Marine Permit Office (MPO) which issues commercial permits for fishing, shellfishing, crabbing, party/charter boats, and non-commercial licenses to collect and possess (LCP).
- Review applications that come through the MPO to ensure that they are reviewed and issued in a timely manner according to the law.
- Develop a tracking and issuing system for Marine LCPs including tracking incoming applications, coordinating program review when necessary, issuance of the license, and the renewal process.
- Program lead for the creation of a new marine permitting system, including the analysis of business needs, requests for proposals, and contracting and developing phases.
- Develop regulations to codify marine permit office practices.
- Supervise a staff of three.

Data and GIS Coordinator
New York State Department of Environmental Conservation
East Setauket, NY

October 2014-April 2018

- Lead the development of the division's data management strategy.
- Coordinate and promote the collection of DMR's citizen science efforts including seagrass monitoring, blue crab fishing, volunteer diver and angler logs, and the striped bass cooperative angler program
- Work with partner agencies and non-governmental programs on projects such as LINAP's Stormwater Infrastructure Mapping Project and the inter-governmental Ocean Mapping Data Team
- Develop the department-wide recreational map standards, modernize the marine permitting system, creation of DMR's Team SharePoint site.
- Solicit and prepare data for inclusion in the Open Data Project and the New York Geographic Information Gateway.
- Manage outreach activities including the division's web presence, coordinating the Shellfishing, and Saltwater Fishing and Boating newsletter, and creating printed materials (signage, kiosks, and brochures).

Education

UNIVERSITY OF RHODE ISLAND, Kingston, RI

August 2022

Graduate Certificate Fisheries Science

PENNSYLVANIA STATE UNIVERSITY, State College, PA

December 2015

Masters Geographic Information Systems

UNIVERSITY OF RHODE ISLAND, Kingston, RI

August 2001

Bachelor of Science Biological Sciences

Additional Skills

- R, ArcGIS, Python, SQL
- Microsoft 365 (Word, Excel, PowerPoint), SharePoint, PowerAutomate

Jessica Steve

(518) 598-7071

jsteve28@gmail.com

CAREER OBJECTIVE

Experienced, reliable, and analytical Marine Biologist who conducts thorough research, authors and revises unit protocols, and builds collaborative relationships with stakeholders to influence accuracy in producing verifiable data and consensus with agency policies and procedures. Communicates clearly with the general public in a relatable fashion to generate awareness and influence interest in and cooperation with conservation efforts.

WORK EXPERIENCE

NYS Department of Environmental Conservation

(December 2019-Present)

Division of Marine Resources, Data Management Unit, Kings Park, NY

Biologist I (Marine)

- Oversee the entry of commercial fishing data into Access database and assign tasks to staff to meet the data needs of the Division.
- Implement and maintain a quality control program for Vessel Trip Report data to find and correct errors in the dataset.
- Review and update documentation of standard procedures for the Unit as needed to ensure staff are following unit protocols consistently.
- Represent New York in meetings and committees with other state and federal agencies to promote management measures that benefit New York's fishing community.
- Supervise one Fish & Wildlife Tech 1 and provide guidance on daily tasks for two contract staff members.
- Manage Standard Atlantic Fisheries Information System (SAFIS) for New York and provide instruction on electronic reporting to permit holders.
- Act as FOIL Coordinator for Division of Marine Resources (April 2021 to present).

Atlantic States Marine Fisheries Commission

(November 2018-December 2019)

Atlantic Coastal Cooperative Statistics Program, East Setauket, NY

New York Assistant State Coordinator

- Managed project involving entry and quality control of NY commercial fishing data from 2008 to 2012.
- Administered SAFIS for New York's electronic Dealer and Vessel Trip Reporting.
- Performed monthly quality control checks on fisheries data to ensure accuracy and completeness of dataset.
- Trained and supervised three data entry clerks.

New York Data Entry Clerk

(July 2018 – November 2018)

- Entered New York commercial fisheries data into Access from State and Federal Vessel Trip Reports.
- Created SAFIS accounts and assisted permit holders with electronic reporting online and via mobile app.
- Conducted annual reporting compliance program.
- Interacted with fishermen regarding catch data and Vessel Trip Report protocols.

North Carolina Department of Environmental Quality*(February 2016-July 2018)*

Division of Marine Fisheries, Striped Bass Unit, Elizabeth City, NC

Marine Fisheries Technician II

- Conducted Independent Gill Net and Juvenile Abundance trawl surveys.
- Trained four technicians on sampling and data collection procedures.
- Tagged Striped Bass, collected scales and fish ear bones, pressed and aged Striped Bass scales.

NYS Department of Environmental Conservation*(September 2014-February 2016)*

Division of Marine Resources, Diadromous Unit, East Setauket, NY

Fish and Wildlife Technician I

- Conducted Western Long Island Striped Bass beach seining survey.
- Tagged Striped Bass and collected, pressed, and aged Striped Bass and Menhaden scales.
- Entered survey data, Federal and State Vessel Trip Reports into Access databases.

Achievements

- Authored article in New York State's *Conservationist Magazine*, Vol. 70.5, April 2016, entitled "Searching for Stripers - A glimpse into New York's striped bass fishery".
- Co-authored newsletter to members of the Cooperative Anglers Program.
- Created juvenile species identification key.

EDUCATION

Master of Science, Marine Sciences, Stony Brook University, Stony Brook, NY

Bachelor of Science, Marine Vertebrate Biology, Stony Brook University, Stony Brook, NY

OTHER SKILLS AND CERTIFICATIONS

Microsoft Office360 Suite (Access, Sharepoint, Teams, Word, Excel, Powerpoint, Outlook), R/RStudio, Adobe Acrobat DC, New York State Boating Safety Course, Certified PADI Open Water Diver

Environmental Scientist

Analytical marine scientist with a direct focus on data management of the commercial fishing industry. New York State Department of Environmental Conservation, Division of Marine Resources, Commercial Fisheries.

Professional Experience

NYS Department of Environmental Conservation Kings Park, NY

March 2022 - Present

The DEC aims to conserve and improve New York's natural environment and resources while working to control and prevent air, land, and water pollution to enhance the health, safety, and welfare for the people of New York.

Marine Biologist, Data Management, Commercial Fisheries

This job title has a diverse set of responsibilities revolving around marine fisheries, fishery data, quota management, and marine habitat management.

- Extensive use of internal and external database programs to provide NYS with various fisheries datasets.
- Management of two statewide tagging programs with a team of five, strengthening aligning procedures and developing a streamlined process with the available technology and resources.
- Involvement in a variety of partner program tasks representing NYS on various fishery management agencies in the development and implementation of interstate fishery management plans.
- Preparation of reports, staff supervision, participation in meetings, and aiding the work of other divisions.
- Access Database management system, ArcGIS, GitHub, virtual meeting platforms, and ongoing coursework with SQL to gain proficiency in R.

August 2017 - March 2022

Fish & Wildlife Technician, Water Quality, Bureau of Shellfisheries

Monitor and sample approximately one million acres of shellfish lands to certify for the safe harvest of shellfish.

- Composed detailed reports for the Food and Drug Administration and the Interstate Shellfish Sanitation Conference which supply overviews of water quality and regional pollution sources.
 - Arranged and executed needs with the Department of Environmental Conservation's FDA approved Microbiology Laboratory.
 - Served in compliance with the Environmental Protection Agency, the Interstate Shellfish Sanitation Conference, and the National Marine Fisheries Service.
 - Used Geographic Information Systems to conduct shoreline pollution source surveys and generated detailed maps.
 - Extensive use of ArcGIS, Nearmap, virtual meeting platforms, and Microsoft Office suite programs.
 - Self-authored articles for New York State conservation-based magazine, Conservationist, as well as for the Department of Environmental Conservation's public website.
-

Brevard Zoo

Melbourne, FL

August 2015 - December 2016

AZA accredited facility with a mission of environmental conservation through education and participation.

Lead Lagoon Naturalist, Education Staff

Led the science based marine conservation program, *Lagoon Quest*, for public schools across the county.

- Worked with a team of five to manage daily operations of *Lagoon Quest*, a six hour outdoor STEM-inspired program for school-aged children.
- Introduced topics of environmental importance; healthy waterways, adverse effects of excess nutrients, hypoxic environments, runoff, and marine pollution.
- Maintained relationships with participating institutions and collaborated with teachers to execute program events.
- Strengthened public speaking, staff and scheduling management, program development and budgeting.
- Collaborated with other education staff to coordinate events and engaged in logistics planning.

Education

Bachelor of Science, Marine Biology
Florida Institute of Technology
Melbourne, FL



SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

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Call: (843) 571-4366 | Toll-Free: (866) SAFMC-10 | Fax: (843) 769-4520 | Connect: www.safmc.net

Melvin Bell, Chair | Carolyn N. Belcher, Ph.D., Vice Chair
John Carmichael, Executive Director

August 17, 2022

Atlantic Coastal Cooperative Statistics Program
1050 N. Highland St. Ste. 200 A-N
Arlington, VA 22201

We are pleased to submit the proposal titled, “FY23: Expansion of the FISHstory Citizen Science Project.” It is being submitted as a new proposal. The FISHstory pilot project was developed through the SAFMC’s Citizen Science Program. It uses historic photos from the 1940s-1970s to document for-hire catch and size composition for a time before recreational catch monitoring programs were established in the South Atlantic region. This proposal builds on the success of the pilot and will expand the geographic and temporal scope of the project by compiling, archiving, and analyzing additional historic photos from multiple fleets, geographic regions, and from an expanded time range. It will provide additional catch, effort, and length data on the recreational for-hire sector during its nascent period which will offer researchers and managers an understanding of long-term changes in the fisheries and fish populations.

Please let us know if you have any questions or would like any additional information.

Best,

Julia Byrd
South Atlantic Fishery Management Council
4055 Faber Place Drive, Suite 201
North Charleston, SC 20405
Julia.byrd@safmc.net

Applicant Name: South Atlantic Fishery Management Council (SAFMC)

Project Title: FY23: Expansion of the FISHstory Citizen Science Project

Project Type: New

Requested Award Amount: \$121,076

Requested Award Period: One year upon receipt of funds

Submission Date: August 17, 2022

Principal Investigators: Julia Byrd, SAFMC and Jie Cao, North Carolina State University

Collaborators: Chip Collier and Allie Iberle, SAFMC
Ken Brennan and Kyle Shertzer, NOAA Southeast Fisheries Science Center



Photo from the Marianne in September 1965 archived through the FISHstory project.
Credit: Rusty Hudson, Hudson, Stone & Timmons families.

OBJECTIVES:

- Expand geographical and temporal range of the FISHstory citizen science project in support of developing abundance indices for stock assessments of South Atlantic species
- Improve efficiency of data collection and photo processing
- Estimate length compositions for multiple species using the protocols developed during the pilot project with focus on Red Snapper and King Mackerel
- Implement an outreach and engagement strategy to retain FISHstory's current volunteer base and recruit new users

NEED:

Stock assessments, which provide critical information to guide fishery management, rely on historical time-series information to make inferences about how fish stocks have responded to fishing activities. Relative abundance index, e.g., catch per unit effort, and size/age composition are two main types of data that are commonly used in fisheries stock assessments. However, it is rare for these data to reach back to the beginning of exploitation. Consequently, stock assessments often start from the year when these data are available and/or make assumptions about the status prior to that year. Such assumptions on historic stock abundance and size/age composition can have a significant influence on the inferences about fish population, e.g., productivity. Lack of historical information about abundance and size composition of exploited species can result in shifting baselines, against which modern populations are benchmarked. McClenachan et al. (2012) and Rosenberg et al. (2005) demonstrated that omission of relevant historical information typically led to overestimated abundance, underestimated recovery targets, and overestimated fisheries quotas. For instance, excluding the earliest 27 years of time series data in the Atlantic cod assessment resulted in reductions in estimates of maximum level of spawning stock biomass and long-term average biomass (McClenachan et al. 2012).

In the South Atlantic, few fishery-dependent surveys were in existence prior to the 1970s; those that existed were limited in scope and lacked comprehensiveness and continuity. Monitoring of the recreational headboat fishery began in the 1970s, and monitoring of private and charter boat fishing began in the early 1980s. However, there is indication that recreational fisheries were already operating in the region (Clark 1962; U.S. Department of the Interior et al. 1991).

Therefore, for most South Atlantic species (e.g., Red Snapper), traditional abundance indices and size/age composition data are not available for the years prior to 1970, when fisheries had already begun. In fact, for a species such as Red Snapper, the highest commercial landings on record occurred in the 1950s and 1960s. Lack of historical data may impair our ability to measure and understand long-term changes, to set meaningful targets for management and formulate stock rebuilding plans, and to better understand nonstationarity or regime shifts in stock productivity.

Many stock assessments in the South Atlantic region start prior to the 1970s (e.g., SEDAR 73 South Atlantic Red Snapper, SEDAR 38 Update South Atlantic King Mackerel). To account for the lack of information prior to this time period, stock assessment scientists rely on species ratios and catch estimates from other sectors as proxies to estimate landings; alternately modern landings trends are regressed back in time to recreate historical landings (SEDAR 2015). Historic photos have the potential to provide quantifiable species and length composition data at a point in time when fishery dependent surveys of the for-hire fleet did not exist (McClenachan 2009).

Using historic photos to improve recreational catch and size composition information is a 2021-2023 research priority for the SAFMC's Citizen Science Program. It addresses ACCSP recreational priorities #2 – 'Comprehensive for-hire data collection and monitoring' and #4 – 'Biological sampling for recreational fisheries separate from MRIP APAIS' by improving historic catch and effort and biological data from the for-hire sector prior to when fishery dependent catch programs were established in the South Atlantic region. This also matches research recommendations from recent stock assessments for important recreational species including Black Sea Bass, Cobia, Gray Triggerfish, and Red Snapper (SEDAR 2011, 2013, 2016, and 2017).

A pilot citizen science project, [FISHstory](#), aiming to address this historic data gap, was completed in 2022. FISHstory was developed under the SAFMC's Citizen Science Program. This novel project successfully developed a standardized protocol for archiving and analyzing historic photos from the 1940s to 1970s from a for-hire fleet based in Florida to describe the beginnings of the South Atlantic for-hire fishery. The project had three primary components: digitizing and archiving historic fishing photos, analyzing historic photos to estimate for-hire catch composition and effort using crowdsourcing, and developing a method to estimate length distributions from historic photos. Through the pilot project, over 1,370 historical images were digitized and archived. The project established the FISHstory interface on [Zooniverse](#), an online crowdsourcing platform, and developed an electronic data collection protocol using crowdsourcing to analyze historical catch images to determine historical species composition. This method is more cost-effective than traditional analysis techniques and allows for larger volumes of data to be collected in a more efficient manner. The protocol trained volunteers to identify and count the fish and people in the photos using online tutorials and training materials. Each photo was classified by multiple volunteers and when there was disagreement among volunteers, a Validation Team, composed of fishermen and scientists verified species identifications and counts. Through the pilot, over 2,100 volunteers analyzed 1,000 photos which provided information from daily catches of a Florida fleet including species composition, total number by species or species group, and number of anglers per trip. The pilot also verified the feasibility of using an open-source image analysis software to determine historical length estimates. The method developed estimated fish length in the photos using the lumber in the

leaderboards as a scalar. During the pilot project, King Mackerel were measured in the 1,374 archived photos and length compositions were produced.

The pilot FISHstory project demonstrated an opportunity to provide information on historical catch, fishing effort, and length composition for years before dedicated fishery-dependent monitoring. This proposal will build on its success by expanding FISHstory's geographic and temporal range, improving the efficiency of data collection and photo processing using lessons learned through the pilot, and estimating length composition for multiple species. The data collected through this proposal can be integrated into the fishery dependent database and used to develop abundance indices for years during which they are not available. The extended historic time-series of abundance indices can potentially improve the assessments of South Atlantic species. However, in order to develop reliable abundance indices and include them in the assessments, more photos need to be collected and analyzed and a protocol for standardizing catch and effort data needs to be developed. The existing data collected from the FISHstory project are not likely to produce representative abundance indices of South Atlantic fish stocks because the data were collected from one fleet in one area, i.e., Daytona Beach, Florida. We therefore propose expanding the spatial coverage of the data collection in this study. Through the pilot project, several other fishermen across the South Atlantic have indicated they have historical photos they would be willing to share with the FISHstory project.

The photos collected in the pilot FISHstory project were from the 1940s to 1970s. To make the historical abundance indices more useful and informative in the assessment, the historical indices need to be calibrated to existing modern indices used in the assessments. This will result in a complete time-series abundance index, allow better estimation of the productivity of the stock, and provide better information on the range of exploitation and population levels. Monitoring of the recreational headboat fishery began in the 1970s, and the headboat index would be a good candidate modern index. To calibrate historical indices to the headboat index, photos overlapping in time are needed. Therefore, we also propose expanding the temporal range of photo collection in this project (through the 1980s or 1990s).

RESULTS and BENEFITS:

This proposal will build on the success of the FISHstory pilot project which was developed under the SAFMC's Citizen Science Program. The project used an innovative citizen science approach to gather data from historic photos that serve as an untapped source of biological data for years prior to dedicated catch monitoring programs. This proposal aims to expand the geographical and temporal scope of the pilot project by collecting, compiling, archiving, and analyzing additional historic photos from multiple fleets, geographic regions, and from an expanded time range (1940s – 1990s). Additionally, this proposal will continue estimating length compositions for multiple species using the protocols developed during the pilot project with focus on Red Snapper and King Mackerel, two important recreational species. The pilot project

developed a protocol to measure fish length in the historic photos and estimate length compositions using King Mackerel as a test species. This proposal will result in an extended database with more fishery and biological information on the recreational for-hire sector during its nascent period. These comprehensive historic data will offer researchers and managers an understanding of long-term changes in the fisheries and fish populations. Additionally, these historic data will allow us to develop long-term time series of abundance indices for South Atlantic species which can be directly used in the stock assessments. The inclusion of these long-term indices in the assessments will likely improve the population estimates. The length compositions can also be included in the assessments, which can help inform changes in population structure, growth, natural mortality, and recruitment. Ultimately, this proposal will increase the likelihood of more sustainable fisheries in the South Atlantic.

This proposal is a unique opportunity to use a citizen science approach to expand time series of length data and potentially abundance trends back into history. Citizen science, as defined by the Crowdsourcing and Citizen Science Act of 2016, is a form of open collaboration in which individuals participate voluntarily in the scientific process. This project will use citizen scientists in a variety of ways (see APPROACH): data submission through photographs, data analysis with crowdsourcing, and data verification through a validation team made up of government and academic scientists along with fishermen as citizen scientists.

Citizen science is growing in the United States and other countries (McKinley et al. 2017) and has been used for research, management, policy, and public engagement (Poisson et al. 2020). A growing number of publications has shown that diverse citizen science projects can produce data on par with traditional scientific data when properly designed, implemented, and evaluated (McKinley et al. 2017, Kosmala et al. 2016, Freitag et al. 2016). The FISHstory pilot project developed protocols that helped ensure the data collection methods would minimize bias, be appropriate for use in management, and could be expanded if the pilot project was successful (Byrd et al. in press). Additionally, citizen science projects can foster learning opportunities, increase scientific engagement and acceptance, and can help build positive relationships within the community (Fairclough et al. 2014). The FISHstory pilot project provided an opportunity for volunteers to learn about the beginnings of the South Atlantic for-hire fishery and hone their fish identification skills. It also provided an opportunity for scientists to learn more about the historic fishery from captains operating during this time period. Overall, there was a very positive response to the pilot project from stakeholders across the South Atlantic region and there has been overwhelming support to continue and expand the project.

This proposal addresses ACCSP FY23 Request for Proposal priorities 1a. *Catch, effort, and landing data* and 1b. *Biological data*, as well as ACCSP recreational priorities #2 – ‘Comprehensive for-hire data collection and monitoring’ and #4 – ‘Biological sampling for recreational fisheries separate from MRIP APAIS’ by improving historic catch and effort and

biological data from the for-hire sector prior to when fishery dependent catch programs were established in the South Atlantic region.

The specific benefits to each data type and the rank of the target species within priority matrices included are addressed below.

Primary Program Priority: Catch and Effort: 50%

Historic photos provide the opportunity to collect trip level effort and landings data for the for-hire sector for a historic time period prior to when catch monitoring programs were in place. The for-hire catch composition component of the FISHstory project will provide species composition and catch rate information from this historic time period. The effort and landings data collected through this proposal will be used to develop abundance indices which can be included in the assessments.

Secondary Priority: Biological Sampling: 50%

The length component of the FISHstory project will estimate length compositions for multiple species using the protocols developed during the pilot project. Although estimating fish lengths in historic photos may not be the traditional view of biological sampling, it can provide the same information – lengths of fish if that sampling had been done. If pictures are obtained that overlap some of the traditional sampling programs, the two sources of biological samples – fish lengths – can be compared. Through the pilot project, King Mackerel length compositions were developed for the photos currently archived representing length measurements for over 1,100 fish (Figure 1). For this proposal, length analysts will initially focus on producing length compositions for Red Snapper and updating the King Mackerel length compositions with measurements from newly archived historic photos. Red Snapper is in the top 25% of the ACCSP biological sampling priority matrix and will be undergoing a SEDAR Research Track stock assessment starting in 2024. The PI's and project collaborators will be involved in this assessment, so there is a direct avenue to ensure these data are considered in this assessment. Additionally, a SEDAR South Atlantic King Mackerel operational stock assessment is scheduled to begin in 2025. If time allows, additional species will be measured that are frequently found in the historic photo set and are also in the top 25% of the ACCSP biological sampling matrix, such as Dolphin, Scamp, Red, and Gag Grouper.

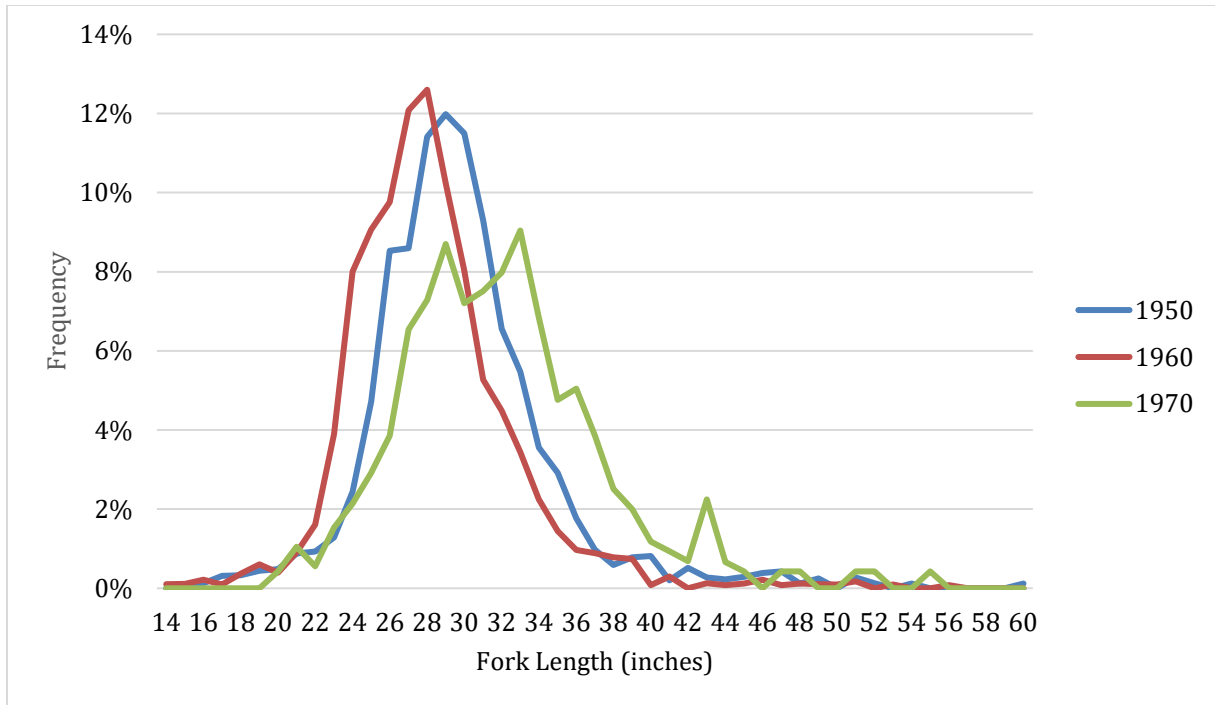


Figure 1. King Mackerel length compositions estimated through the FISHstory pilot project by 10-year time periods.

Stock Assessment and Management Benefits and Impact:

The positive impacts of this project to stock assessment and management could be substantial and are described in the following aspects:

Most stock assessments of South Atlantic species assume fish stocks were virtually unexploited through the 1950's when consistent monitoring of the commercial fishery began, and only lightly exploited through the 1970's when recreational monitoring began. There is very little information on overall catch or size composition to evaluate these assumptions. This proposal will provide fishery-dependent information from a time prior to catch monitoring. These data can help verify these assumptions made in assessments and potentially lead to more accurate assumptions. For example, the size compositions estimated from the photos for the early years can improve the assumptions on the size and therefore age composition of stocks in the initial years included in stock assessments.

Understanding how fishing activities and technological advancements affect fish stocks requires an estimate of what they are capable of producing when there is no fishing or little fishing. However, data rarely extend back to pre-exploitation or the beginning of exploitation. Therefore, stock assessments often start from the year when abundance index and/or size/age compositions are available and/or make assumptions about the status prior to that year. Lack of historic information on abundance and size/age composition can result in biased estimates of productivity and therefore shifting baselines against which modern stocks are benchmarked. This proposal is

designed to expand the FISHstory project in support of developing long-term abundance indices for stock assessments, as well as to estimate length compositions for the early years. The inclusion of these data in the assessments is likely to improve the estimates, e.g., productivity, size/age structure, and recruitment, and therefore increase the likelihood for managers to set meaningful targets for management and formulate stock rebuilding plans.

In addition to the benefits of an extended historic time series for existing assessments, length frequency and catch per unit information can be used in data limited modeling techniques to provide assessments for stocks which are now unassessed. Providing information from periods prior to heavy exploitation is particularly important in data limited frameworks.

DATA DELIVERY PLAN:

Data collected through the for-hire catch and length composition components of the project will be made available to stock assessment scientists, fishery managers, and ACCSP partners as requested. Biological data collected through the length component of the project will be formatted for submission to the ACCSP biological database. Project PI's will coordinate with ACCSP staff on timing and submission of these data to ACCSP.

APPROACH:

Task 1: Compile, digitize and archive historic photos from different fleets, geographic regions, and from an expanded time range (1940s-1990s).

Consultant and Photo Curator, Rusty Hudson

- Process, scan, and catalog ~400 photos compiled by retired Captains Billy Smitherman (FL) and Robert Freeman (NC).

SAFMC

- Plan and implement historic photo scanning events at Council related meetings and other outreach events.
- Help identify and contact additional photo providers from the South Atlantic region and assist with photo compilation.

North Carolina State University (NCSU)

- Help identify and contact additional photo providers from the South Atlantic region and assist with photo compilation.
- Update photo archive spreadsheet.

SEFSC

- Help identify and contact additional photo providers from the South Atlantic region and assist with photo compilation.

Task 2: Collect for-hire species composition data via Zooniverse platform.

SAFMC

- Train NCSU graduate student on the Zooniverse processes developed during the FISHstory pilot project.
- Help identify and assist in implementing improvements to the existing workflows in the FISHstory Zooniverse project to improve data quality and data collection efficiency.
- Assist with Validation team recruitment and training.

NCSU

- Identify and implement improvements to the existing workflows in the FISHstory project in Zooniverse to improve data quality and data collection efficiency.
- Batch & add photos into the Zooniverse project.
- Assist with Validation Team recruitment and training
- Identify photos and coordinate Validation Team review.
- QA/QC & data analysis.

Task 3: Estimate length compositions for multiple species from photo archive focusing initially on Red Snapper and King Mackerel.

SAFMC

- Train graduate student on the length protocol developed during the FISHstory pilot project.
- Help identify and assist with implementing improvements to the length data collection process.
- Assist with length analyst recruitment and training.
- Assist with length measurements, as needed.

NCSU

- Identify and implement improvements to the length data collection process.
- Assist with length analyst recruitment and training.
- Coordinate fish measurements among length analysts.
- QA/QC & data analysis.
- Format data for submission to ACCSP.

Task 4: Design and implement an outreach and engagement strategy.

SAFMC

- Update and refine FISHstory communication and volunteer engagement plan from the pilot project.
- Develop and distribute promotional materials to spread awareness, provide progress updates, and recruit new volunteers for the project using SAFMC communication platforms, collaborations with existing partners, and through the formation of new partnerships.
- Provide monthly newsletters and outreach materials summarizing project findings to active volunteers.
- Monitor talk boards in the FISHstory Zooniverse project.

NCSU

- Help monitor talk boards in the FISHstory Zooniverse project.
- Assist SAFMC with other outreach and volunteer engagement initiatives, as needed.

GEOGRAPHIC LOCATION:

The FISHstory project will digitize, archive, and analyze historic fishing photos throughout the South Atlantic region (North Carolina through the East Coast of Florida to the Florida Keys). The catch and biological data collected through the program will be available to all other partners for use in assessment and management. Although the geographic scope of the project focuses on the South Atlantic region, the FISHstory image analysis methods have a high likelihood of scalability and transferability to other ACCSP partners throughout the Atlantic coast who have similar historic photos.

FUNDING TRANSITION PLAN:

The initial year of funding for the FISHstory project will focus on compiling and archiving additional photos, collecting additional catch and effort data through the FISHstory project in Zooniverse, and estimating length composition for multiple species. An additional year of funding will be needed to develop indices of abundance using the data collected through the project. Project PI's are already developing proposals to submit through other funding opportunities to help support an additional year of this project.

MILESTONE SCHEDULE:

Task	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
Digitize & archive additional photos	x	x	x	x	x	x	x					
Identify and implement improvements to existing workflows and training materials in Zooniverse	x	x	x	x								
Re-launch project & collect data in Zooniverse				x	x	x	x	x	x			
Validation Team photo review						x	x	x	x			
For-hire catch composition analysis								x	x	x		
Identify and implement improvements to existing length protocol and training materials		x	x									
Length measurements & analysis			x	x	x	x	x	x				
Volunteer outreach & communication	x	x	x	x	x	x	x	x	x	x	x	x
Data sharing preparation & report writing										x	x	x

PROJECT ACCOMPLISHMENTS MEASUREMENTS:

Component	Deliverables
Photo archiving	Five photo scanning events are planned and implemented. Target of 400 additional photos digitized and archived.
For-Hire Catch Composition	Workflows and training materials refined; FISHstory project relaunched in Zooniverse; target of 600 photos analyzed and validated for species composition, as needed.
Length Composition	Length processes and training materials refined; target for all photos in archive to be analyzed for Red Snapper length composition estimates; target for any photos added to the archive through this project to be analyzed for King Mackerel lengths and length composition analysis to be updated.
Volunteer Outreach & Engagement	Staff will work to retain current and recruit new FISHstory volunteers for the Zooniverse project, Validation team, and length analysts. Validation team members and length analysts will receive virtual training sessions. Active volunteers will receive monthly project updates via electronic/print/social media outlets and an end of the year progress report for the project. Data visualizations will be provided on trends in species/length composition and how the data may be used.
Data Sharing Preparation & Report Writing	Data will be compiled and formatted for transfer to ACCSP, SEDAR and others for use in assessments and management. Final project report is completed outlining the project findings, successes, and lessons learned.

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U.S. Department of the Interior, U.S. Fish and Wildlife Service, U.S. Department of Commerce, and U.S. Census Bureau. 1991. 1991 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation. 177 pp. Available online at: <https://www2.census.gov/programs-surveys/fhwar/publications/1991/fhw91-us.pdf>.

FY23 BUDGET:

Item	ACCSP Share	Partner Share	Total
PERSONNEL COSTS			
SAFMC Personnel Julia Byrd, Citizen Science Program Manager (2 months; salary and fringe) Allie Iberle, Fishery Scientist (0.5 months; salary and fringe)		\$24,066 \$4,441	
SEFSC Personnel Ken Brennan, Kyle Shertzer, and headboat port agents		\$5,000	
CONTRACT			
A. Consultant and photo curator Processes, scans and catalogs ~ 400 photos (Smitherman and Freeman photos)	\$3,500		
B. North Carolina State University (NCSU)			
1) Personnel Graduate student stipend PI summer salary (0.5 months)	\$28,000 \$4,675		
2) Fringe Graduate student fringe PI fringe	\$5,235 \$1,437		
3) Tuition NCSU (Year 1)	\$10,005		

4) Travel	\$2,039		
5) Indirect at 27.6%	\$11,422		
TOTAL NCSU Contract	\$62,813		
TRAVEL			
Support for SAFMC staff to compile and digitize photos via scanning nights at Council related meetings and other outreach events	\$6,325		
SUPPLIES			
Portable photo scanner	\$600		
Software design packages	\$870		
Outreach, promotional, and training materials	\$5,500		
Indirect costs - 10% of total costs	\$7,961		
TOTAL	\$87,569	\$33,507	\$121,076
Percentage	72%	28%	100%

BUDGET NARRATIVE:

Contractual (\$66,313):

A) Rusty Hudson (\$3,500): Hudson will be a project consultant and photo curator. He will process, scan, and catalog ~400 photos compiled by retired Captains Billy Smitherman (FL) and Robert Freeman (NC).

B) North Carolina State University (\$62,813)

Personnel (\$32,675 total)

- Jie Cao, Ph.D., Principal Investigator (0.5 calendar month) will be responsible for supervising the graduate student, \$4,675
- Graduate student (12 calendar months), \$28,000

Fringe Benefits (\$6,672 total)

- Jie Cao, Ph.D., Principal Investigator, \$1,437
- Graduate student, \$5,235

Fringe benefits are requested for personnel on this project at the following rates:

	Fringe Benefits (% of salary)	Health Insurance per FTE
Faculty/Staff	30.73%	\$6,512
Faculty (summer months)	30.73%	N/A
Postdoctoral Associates	9.05%	\$4,336
Graduate Students	9.05%	\$2,701
Hourly Workers	9.05%	N/A

Travel (\$2,038.8 total)

Funds are requested for travel as follows:

Purpose of Travel	Location	Item	Rate	Cost
Council visits	South Carolina	Mileage	\$0.585/mile * 600 miles * 3 trips	\$1053
		Hotel	\$120/person * 1 person * 2 nights * 3 trips	\$720
		Per Diem (meals)	\$44.3/day * 1 person * 6 days	\$265.8

Note: NCSU travel rate estimates are based on NC state reimbursement and per diem rates.

Other Direct Costs (\$10,005 total)

Tuition

- The estimated graduate student’s tuition rate at NCSU in 2023-2024 is \$10,005 based on a 10% increase over 2022-2023 rates.

Indirect Costs (\$11,422 total)

- Indirect costs are applied at the off-site research rate of 27.60% of Modified Total Direct Costs. Indirect costs are calculated on the total NCSU contract minus tuition costs. North Carolina State University’s indirect cost rate agreements and other information can be found here: <https://research.ncsu.edu/sparcs/budgeting-guidelines/budgeting-f-and-a/>

Total Contractor Costs (\$62,812.8 total)

Travel (\$6,325): Support will be used for staff to travel throughout the South Atlantic region to compile and digitize historic photos via scanning nights at Council related meetings and other outreach events and to distribute promotional materials. Funds are requested to support travel for two staff members on five trips approximately 2-3 days each. Costs are estimated for a total of 20 hotel nights (10 per staff member at \$120/night), 30 days per diem (15 per staff member at \$75/day), ~1400 miles for four trips (at \$0.625/mile) and two airplane fares at ~\$400/ticket.

Note: Council travel rate estimates are based on federal reimbursement and per diem rates.

Supplies (\$6,970): Funding will be used to purchase a portable photo scanner (estimated at \$600) to use at photo scanning events. Design software annual subscriptions will be purchased (Adobe Creative Cloud and Canva Pro estimated at \$870 for annual subscriptions) to assist with photo manipulation and help design outreach, promotional, and training materials. Promotional, outreach, and training materials (estimated at \$5500) will be purchased and distributed to raise awareness about the project, help with volunteer recruitment and retention, and share project updates and results. Cost for print materials range from wallet cards (~\$0.05 each) to flyers (~\$1.50 each). Using an average cost of \$0.78 per item \$2,000 will allow us to print 2,564 items for distribution. Funds will also be used to purchase small promotional items (e.g. notebooks, stickers, etc.) to help increase recruitment and retention of participants. Cost for promotional items range between stickers (~\$1.50 each) to notebooks (~\$4.00 each). Using an average cost of \$2.75 per item, \$3,500 will allow us to distribute ~1,272 items to participants. Materials would potentially be distributed through industry business and organizations (e.g. tackle shops, trade shows), educators (e.g. marine educator organizations, fisheries graduate and undergraduate programs, and K-12 classrooms), citizen science organizations (e.g. SciStarter) and fisheries organizations.

Indirect charges of 10% are applied to the total cost of the grant for a total of \$7,961.

Summary of Proposal for Ranking

Proposal Type: New

Primary Program Priority: Catch and Effort - 50%

This proposal addresses ACCSP recreational priority #2 – ‘Comprehensive for-hire data collection and monitoring’ by improving historic catch and effort data prior to when fishery dependent catch programs were established in the South Atlantic. Historic photos provide the opportunity to collect trip level effort and landings data for the for-hire sector for a historic time period prior to when catch monitoring programs were in place in the South Atlantic. The for-hire catch composition component of the FISHstory project will provide species composition and catch rate information from this historic time period. The effort and landings data collected through this proposal will be used to develop abundance indices which can be included in stock assessments.

Data Delivery Plan:

Data collected through the for-hire catch and length composition components of the project will be made available to stock assessment scientists, fishery managers, and ACCSP partners as requested. Biological data collected through the length component of the project will be formatted for submission to the ACCSP biological database. Project PI’s will coordinate with ACCSP staff on timing and submission of these data to ACCSP.

Project Quality Factors:

- **Multi-partner/Regional impact including broad applications:**

Partners in this proposal include the SAFMC, NOAA Fisheries SEFSC, and NC State University. The FISHstory project will digitize, archive, and analyze historic fishing photos throughout the South Atlantic region (North Carolina through the East Coast of Florida to the Florida Keys). The catch and biological data collected through the program will be available to all other partners for use in assessment and management. Although the geographic scope of the project focuses on the South Atlantic region, the FISHstory image analysis methods have a high likelihood of scalability and transferability to other ACCSP partners throughout the Atlantic coast who have similar historic photos.

- **Contains funding transition plan:**

The initial year of funding for the FISHstory project will focus on compiling and archiving additional photos, collecting additional catch and effort data through the FISHstory project in Zooniverse, and estimating length composition for multiple species. An additional year of funding will be needed to develop indices of abundance using the data collected through the project. Project PI’s are already developing proposals to

submit through other funding opportunities to help support an additional year of this project.

- **In-kind contribution: 28%**

- **Improvement in data quality/quantity/timeliness**

- This proposal will build on the success of the FISHstory pilot project which uses an innovative citizen science approach to gather data from historic photos to provide for-hire catch and effort and biological information before fishery dependent monitoring programs were in place in the South Atlantic region.
- By expanding the geographic and temporal scope of FISHstory, this proposal will collect more representative historic data for the South Atlantic region which will broaden the use of the data for both stock assessment and management.
- These historic data will provide researchers and managers a better understanding of the long-term changes in the fisheries and fish populations.

- **Potential secondary module as a by-product: Biological - 50%.**

This proposal addresses ACCSP recreational priority #4 – ‘Biological sampling for recreational fisheries separate from MRIP APAIS’ by improving historic biological data prior to when fishery dependent catch programs were established in the South Atlantic. Although estimating fish lengths in historic photos may not be the traditional view of biological sampling, it can provide the same information. The length component of the FISHstory project will estimate length compositions for multiple species using the protocols developed during the pilot project. Length analysts will initially focus on producing length compositions for Red Snapper and King Mackerel in the historic photos. Red Snapper is in the top 25% of the ACCSP biological sampling priority matrix and will be undergoing a SEDAR Research Track stock assessment starting in 2024. A SEDAR South Atlantic King Mackerel stock assessment is scheduled to begin in 2025. If time allows, additional species will be measured that are frequently found in the historic photo set and are also in the top 25% of the ACCSP biological sampling matrix, such as Dolphin, Scamp, Red, and Gag Grouper.

- **Impact on stock assessment**

Stock assessment impacts from this proposal are significant.

- Most stock assessments of South Atlantic species assume fish stocks were virtually unexploited through the 1950’s when consistent monitoring of the commercial fishery began, and only lightly exploited through the 1970’s when recreational monitoring began. There is very little information on overall catch or size composition to evaluate these assumptions. This proposal will provide fishery-dependent information from a time prior to catch monitoring. These data

can help verify these assumptions made in assessments and potentially lead to more accurate assumptions.

- Lack of historic information on abundance and size/age composition can result in biased estimates of productivity and therefore shifting baselines against which modern stocks are benchmarked. This proposal is designed to expand the FISHstory project in support of developing long-term abundance indices for stock assessments, as well as to estimate length compositions for the early years. The inclusion of these data in the assessments is likely to improve the estimates, e.g., productivity, size/age structure, and recruitment, and therefore increase the likelihood for managers to set meaningful targets for management and formulate stock rebuilding plans.
- Length frequency and catch per unit information can be used in data limited modeling techniques to provide assessments for stock which are now unassessed. Providing information from periods prior to heavy exploitation is particularly important in data limited frameworks.

Other Factors:

- **Innovative**

Historic photos serve as an untapped source of catch, effort, and biological information for years prior to dedicated catch monitoring programs. This proposal uses an innovative citizen science approach to gather data from historic photos. The methodology developed is more cost-effective than traditional analysis techniques and allows for larger volumes of data to be collected in a more efficient manner using the power of the crowd.

- **Properly prepared**

This proposal follows the guidelines under the ACCSP Funding Decision Process Document.

- **Merit**

This proposal builds on a successful pilot project that demonstrated historic photos have the potential to provide quantifiable species and length composition data at a point in time when fishery dependent surveys of the for-hire fleets didn't exist in the South Atlantic. This proposal will provide catch and effort and biological data for a time period where data are very limited for the recreational sector. These data will satisfy several species specific research recommendations. Additionally the biological data collected include species from the top 25% of the FY23 ACCSP Biological matrix.

JIE CAO

Assistant Professor
Department of Applied Ecology
Center for Marine Sciences and Technology
North Carolina State University

303 College Circle
Morehead City, NC 28557
Phone: 252-222-6331
Email: jcao22@ncsu.edu

Education

Ph.D. Marine Biology	2015	University of Maine
M.S. Marine Fisheries Resources	2010	Shanghai Ocean University
B.S. Marine Fisheries Sciences	2007	Shanghai Ocean University

Professional Experience

2018 – present	Assistant Professor, NCSU, Morehead City, NC
2017 – 2018	Post-doctoral Associate, UW&NOAA, Seattle, WA
2015 – 2017	Post-doctoral Associate, UM, Orono, ME

Advisory Board

2020 – present	SSC, South Atlantic Fishery Management Council
2019 – present	Vice-chair of SC, North Pacific Fisheries Commission
2019 – present	Vice-chair of WP billfish, Indian Ocean Tuna Commission

Selected publications

- Cao J**, Thorson J, Punt A, and Szuwalski C, A novel spatiotemporal stock assessment framework to better address fine-scale species distributions: development and simulation testing. *Fish and Fisheries*, 2019. DOI:10.1111/faf.12433
- Cao J**, Thorson J, Richards A, Chen Y. Spatio-temporal index standardization improves the stock assessment of northern shrimp in the Gulf of Maine. *Canadian Journal of Fisheries and Aquatic Sciences*, 2017.
- Cao J**, Chen Y, Richards A. Improving assessment of *Pandalus* stocks using a seasonal, size-structured assessment model with environmental variables: Part I: Model description and application. *Canadian Journal of Fisheries and Aquatic Sciences*, 2017, 74(3): 349-362.
- Cao J**, Chen Y, Richards A. Improving assessment of *Pandalus* stocks using a seasonal, size-structured assessment model with environmental variables: Part II: Model evaluation and simulation. *Canadian Journal of Fisheries and Aquatic Sciences*, 2017, 74(3) 363-376.
- Cao J**, Guan WJ, Treusdell S, et al. An individual-based probabilistic model for simulating fisheries population dynamics. *Aquaculture and Fisheries*, 2016, 1:34-40.
- Cao J**, Chen XJ, Tian SQ. Bayesian hierarchical DeLury model for stock assessment of west winter-spring cohort of neon flying squid (*Ommastrephes bartramii*) in northwest Pacific Ocean. *Bulletin of Marine Science*, 2014, 91(1): 1-13.
- Cao J**, Truesdell S, Chen Y. Impacts of seasonal stock mixing on the assessment of Atlantic cod in the Gulf of Maine. *ICES Journal of Marine Science*, 2014, 71(6): 1443-1457.

Guan WJ, **Cao J**, Chen Y, et al. Impacts of population and fishery spatial structures on fishery stock assessment. *Canadian Journal of Fisheries and Aquatic Sciences*, 2013, 70 (8): 1178-1189.

Cao J, Chen XJ, Chen Y. Influence of surface oceanographic variability on abundance of the western winter-spring stock of neon flying squid (*Ommastrephes bartramii*) in the northwest Pacific Ocean. *Marine Ecology Progress Series*, 2009, 381: 119-127.

Funded Research Projects

Estimating seasonal growth and size-dependent mortality of North Carolina blue crab in support of improving its stock assessment and management. North Carolina Sea Grant. **J. Cao**, L. Yan, D. Eggleston, J. Buckel, L. Lee, A. Rocco. \$59,692 US Dollars, 2022-2023.

Spatiotemporal distribution and habitat use of major Snapper-Grouper species in the Atlantic Ocean off the southeastern U.S. NOAA/CISESS. **J. Cao**. \$39,384 US Dollars, 2021-2022

Development and Application of an International Stock Assessment and Management Strategy Evaluation Tool for Common Dolphin (*Coryphaena Hippurus*) in the Atlantic Ocean and the Caribbean Sea (Matthew Damiano, 2020 NMFS-Sea Grant Population Fellowship). North Carolina State University Sea Grant Program. **J. Cao**, K. Shertzer, M. Damiano. \$118,817 US Dollars, 2020-2023.

Evaluating the Impacts of Environmental Stress and Bioactive Chemicals on North Carolina Blue Crab Population: An Individual-Based Model. North Carolina Sea Grant. **J. Cao**, L. Yan, L. Lee. \$56,786 US Dollars, 2020-2021.

Development and application of a management strategy evaluation tool: tradeoffs between the management objective of recreational and commercial fisheries. Marine Fisheries Initiative (MARFIN) Program, NOAA. **J. Cao**, K. Shertzer. \$121,756 US Dollars, 2019-2021.

Promoting China-US collaborative research on assessment and management of Chinese fisheries. Packard Foundation. R. Hilborn, C. Szuwalski, A. Punt, **J. Cao**. \$222,628 US Dollars, **Cao's subaward**: 31,850 US Dollars, 2019-2020.

Incorporating environmental variables to improve assessment and predictive capacity for American lobster in a changing Gulf of Maine and southern New England. The Fisheries and the Environment (FATE) Program, NOAA. B. Shank, Y. Chen, **J. Cao**, K. Tanaka. \$182,633 US Dollars. 2017-2019.

Incorporating environmental and ecological variables to improve the assessment of northern shrimp in the Gulf of Maine. The Fisheries and the Environment (FATE) Program, NOAA. A. Richards, Y. Chen, **J. Cao**, K. Drew. \$106,104 US Dollars. 2015-2017.

Evaluate performance of length-structured models for the assessment of northern shrimp and Atlantic herring in the Gulf of Maine. Maine Sea grant Program. Y. Chen, **J. Cao**. \$143,778 US Dollars. 2014-2016.

JULIA ISOBEL BYRD

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Charleston, SC 29412
Hometown: Asheville, NC

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Cell: (828)215-1414
Email: juliabyrd@hotmail.com

EDUCATION: UNIVERSITY OF CHARLESTON, SC, Charleston, SC

-**Masters of Environmental Studies**, focus on environmental and marine biology,
December 2004

WAKE FOREST UNIVERSITY, Winston-Salem, NC

-**Bachelor of Science in Biology**, Minor in **Environmental Studies**, Cum Laude, May 2000

WORK EXPERIENCE:

Citizen Science Program Manager, South Atlantic Fishery Management Council (SAFMC; March 2019 – present)

- Provide programmatic leadership and support for the SAFMC's Citizen Science Program
- Foster collaboration between researchers, scientists, and fishermen to design and support citizen science projects
- Develop grant proposals for citizen science projects and assist program partners in developing grants
- Serve as PI or co-PI on grant supported citizen science projects addressing SAFMC research priorities; duties include project design and management, oversight of data collection, data QA/QC and analysis, report writing, and grants administration
- Assist in developing and delivering outreach materials and training related to the Citizen Science Program and projects
- Work with partners and advisory committees to develop and implement strategic plan for Citizen Science Program, including development of goals, objectives, strategies, indicators, and evaluation plan
- Develop and deliver training programs to work with participants to design and implement citizen science projects
- Conduct presentations for advisory committees, the general public, fishermen, and scientists on the SAFMC's Citizen Science Program and projects
- Communicate scientific, technical issues to a variety of audiences
- Build relationships with fishery professionals and stakeholders throughout the Southeast U.S. to develop program partnerships and help engage more people in the SAFMC's Citizen Science Program
- Staff lead for Citizen Science Projects Advisory Committee and Operations Committee
- Supervise Citizen Science personnel (staff and students) working on citizen science projects
- Serve as member of the SAFMC Outreach Team providing input and participating in Council related outreach activities
- Represent the SAFMC on various citizen science related working groups
- SAFMC's representative on the Atlantic Coastal Cooperative Statistics Program Operations Committee

Adjunct faculty at the College of Charleston (2020 to present)

- Serve as a primary advisor and/or thesis committee member for Masters of Environment and Sustainability Studies graduate students

**Southeast Data Assessment and Review (SEDAR), South Atlantic Fishery Management Council (SAFMC)
SEDAR Coordinator (August 2012 – February 2019)**

- Plan, coordinate and manage SEDAR stock assessment projects and procedural workshops. Duties include project management, work planning, timeline development, brainstorming strategies, problem solving, event planning, and facilitation.
- Chair and/or facilitate SEDAR stock identification, data, assessment and procedural workshops. Experience includes facilitating variety of group discussions engaging scientists, managers, fishermen, and other stakeholders in order to lead groups through productive discussions and explore different points of view.

- Build relationships with fishery professionals and stakeholders throughout the Southeast U.S. to help engage more people in the SEDAR Stock Assessment Program.
- Communicate scientific, technical issues to a variety of audiences
- Lead re-design of the SEDAR website and serve as SEDAR webmaster.
- Assist with coordination and facilitation of SAFMC's Snapper Grouper Visioning Project
- Assist with the development of the SAFMC's Citizen Science Program. Duties included helping coordinate and facilitate SAFMC's Citizen Science Workshop, helping develop SAFMC's Citizen Science Blueprint, and assisting the Citizen Science Program Manager in developing infrastructure for the Program.
- SAFMC's representative on the Atlantic Coastal Cooperative Statistics Program Operations Committee
- Instructor for Marine Recreational Education Program, Southeast – Science Workshop 2017
- Participate in SCDNR's in-water sea turtle regional abundance and health assessment survey as Chief Scientist or Scientific Crew

TRAINING:

- Management Assistance Team (MAT) Leader as Communicator Training
- Smithsonian's Communication & Facilitation Skills for Conservation Managers Course
- Technology of Participation (TOP) Facilitation Methods
- NOAA Coastal Service Center Planning and Facilitating Collaborative Meetings
- Well's National Estuarine Research Reserve Coastal Training Program Collaborative Learning Workshop
- NOAA Coastal Service Center Project Design and Evaluation Workshop
- NOAA Coastal Service Center Public Issues and Conflict Management Workshop
- University of Maryland's Communicating Science Effectively Workshop
- NOAA Coastal Service Center Community Based Social Marketing Workshop
- Basic and Advanced Microsoft Access Training Workshop
- Atlantic States Marine Fisheries Commission Basic Stock Assessment Workshop
- Atlantic States Marine Fisheries Commission Maximum Likelihood Modeling Workshop

PROFESSIONAL MEMBERSHIPS:

- Citizen Science Association
- American Fisheries Society
- SC Chapter of the American Fisheries Society
- ACCSP Operations Committee (2015-present)

SELECTED PUBLICATIONS AND PRESENTATIONS:

- Byrd, J. W.R. Collier, and A. Iberle. In press. Designing the FISHstory project to support fisheries management. *Fisheries*.
- Oremland, L., A. Furnish, J. Byrd, and R. Cody. In press. How fishery managers can harness the power of the crowd: Using citizen science and non-traditional data sources in fisheries management. *Fisheries*.
- Bonney, R., J. Byrd, J. T. Carmichael, L. Cunningham, L. Oremland, J. Shirk, and A. Von Harten. 2021. Sea Change: Using Citizen Science to Inform Fisheries Management. *BioScience*: 71(5): 519-530.
- Byrd, J. A. Iberle, C. Collier, D. Cathey, J. Simpson, F. Karp, B. Spain, K. Knowlton, and M. Bucko. 2021. Development of the SciFish Application, a customizable citizen science project builder. American Fisheries Society Annual Meeting. (Oral presentation)
- Byrd, J. C. Collier, and A. Iberle. 2020. The SAFMC's Citizen Science Program: Designing a program to support fisheries science and management decision making. American Fisheries Society Annual Meeting (held virtually). (Oral presentation)
- Brown, S.K., M. Shivani, R. Koenke, D. Agnew, J. Byrd, M. Cryer, C. Dichmont, D. Die, W. Michaels, J. Rive, H. Sparholt, and J. Weiberg. 2020. Patterns and practices in fisheries assessment peer review systems. *Marine Policy*: 117,103880.
- Byrd, J., J. Carmichael, and J. Neer. 2017. The Importance of Peer Review in SEDAR Stock Assessments. American Fisheries Society Annual Meeting, Tampa, FL. (Oral presentation)
- VonHarten, A. and J. Byrd. 2016. Building a Fishery Citizen Science Program in the U.S. South Atlantic to Improve Management and Policy. 4th International Marine Conservation Congress. (Oral presentation and helped facilitate focus group.)
- SEDAR. 2015. SEDAR Procedural Workshop 7: Data Best Practices. SEDAR, North Charleston, SC. 151pp. (editor)



Geoff White, Director
Atlantic Coastal Cooperative Statistics Program
1050 N. Highland Street, Suite 200 A-N
Arlington, VA 22204

August 17, 2022

Dear Mr. White,

The Rhode Island Division of Marine Fisheries is pleased to submit the proposal titled “*Collection of Recreational Fishing Data from Citizen Science Sources*” for your review. We believe this proposal is an important step toward integration of various voluntary recreational angler catch and effort data streams into ACCSP SAFIS databases.

Please address questions to John Lake of the Rhode Island Division of Marine Fisheries.

Sincerely,

John Lake
Rhode Island Department of Environmental Management
Division of Marine Fisheries
3 Fort Wetherill Road
Jamestown, RI 02835
john.lake@dem.ri.gov
401-212-7538

Enclosures:

ACCSP Proposal: “*Collection of Recreational Fishing Data from Citizen Science Sources*”
Appendix A: Principal Investigators’ Curricula Vitae

Proposal for Funding made to:
Coordinating Council and the Operations Committee
Atlantic Coastal Cooperative Statistics Program
1050 N. Highland St., Ste. 200 A-N
Arlington, VA 22201

FY23: Collection of Recreational Fishing Data from Citizen Science Sources

Submitted By:
John Lake
Rhode Island Department of Environmental Management
Division of Marine Fisheries
3 Fort Wetherill Road
Jamestown, RI 02835
john.lake@dem.ri.gov

Proposal for FY2023 ACCSP Funding

Applicant Name: Rhode Island DEM

Project Title: **Collection of Recreational Fishing Data from Citizen Science Sources**

Project Type: New Project

ACCSP Program Priorities: Recreational Catch and Effort Module

Principal Investigators: John Lake, Supervising Biologist, john.lake@dem.ri.gov

Requested Award Amount: **\$134,000**

Requested Award Period: One year upon receipt of funds

Submission Date: August 17, 2022

Objectives:

- To obtain recreational catch and effort data from anglers who are utilizing commercially available logbook applications acting as citizen scientists to provide data that is currently lacking by current collection methods.
- To evaluate the submitted data and construct them in a standardized manner to be sent to the ACCSP through currently available or future application interfaces (API).
- Produce and deliver data which can be analyzed by the respective States for comparison with other sources of recreational data.
- To utilize the data collected to make better informed decisions in relation to recreational fisheries.
- Implement product enhancement and outreach activities to increase the quantity of citizen science-based recreational fishing data submissions.

Need:

According to the 2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation issued by the U.S. Fish and Wildlife Service, there were 151,000 saltwater anglers in Rhode Island, accounting for over 1.1 million trips.

The recreational angling community has been asking to have a feedback mechanism for discard data over the past ten years, the most common of which has been for Black Sea Bass and Striped Bass - two species with high discard rates in our region. While kept catch is a common and accurate reported data element of angler data collection programs, uncertainty remains around quantifying discard fish remains.

Understanding the magnitude of discards is imperative, as many species have associated discard mortality rates that are otherwise unaccounted for. Further, recreational discard data is becoming increasingly important as more recreational species have had regulatory actions aimed at reducing harvest. For example, RIDEM is in the decision-making process of reducing harvests on Striped Bass, moving from two fish to one fish and increasing the size limit on Scup and/or Black Sea Bass this year. The resulting shortened fishing seasons, lower bag limits and increased minimum sizes have increased the number of fish discarded at sea and thus not available for direct observation and measurements. The only direct measurements of discarded fish take place during at-sea observations on head boats. Having an alternative data source to obtain this discard information on these species would be a great help in the regulatory decision-making process.

The accuracy of discard data collected via the Marine Recreational Information Program (MRIP) in-shore and private/rental modes suffers from angler recall bias. Discard data from other volunteer logbooks have been used in previous stock assessments, notably for bluefish in 2015, where the value of these data streams has been proven.

Results and Benefits

In addition to discard data, volunteer data from commercially available mobile apps will be useful for improving the Rhode Island MRIP Access Point Angler Intercept Survey (APAIS). In 2019, there were 2,496 MRIP intercepts in Rhode Island for shore and private/rental anglers. Effort statistics and catch rates for various species will be compared to those estimated by APAIS to provide further insight on the accuracy of the estimates. These comparisons will allow

RIDMF staff to identify areas of the MRIP site registry which need to be repressured to accurately capture the level of recreational fishing in the state.

These comparisons to MRIP will be particularly helpful for short term or pulse fisheries such as Atlantic Cod and Tautog. Both these recreational fisheries take place in a discrete time frame outside of intense sampling periods. Having additional information of the timing of when the fishing effort and harvest is taking place will allow managers to direct sampling efforts in a more directed manner to increase sample size and thus improve estimates for these species.

This project will also address the desire from anglers to participate in fisheries management as citizen scientists. Many of these anglers currently utilize a mobile application to assist them with understanding fisheries rules and regulations and/or to collect data about their trips and catches with the hope of improving their fishing experience. These recreational anglers are aware of the capabilities of smart devices to facilitate all aspects of both professional and everyday life. As a group, they see themselves as an additional source of data, one that is often overlooked. The random nature of the MRIP survey does not guarantee an opportunity for all anglers to provide data about their fishing activity on a regular basis. As such, the lack of input can lead to disenfranchisement of anglers to the MRIP survey. Although volunteer logbook data does not feed into MRIP, in cases where anglers disagree with an estimate, knowing they have contributed data that may be used to make improvements in the future will likely lead to increased confidence in the data and trust between stakeholders and managers.

This project will develop and test the infrastructure required to collect recreational fishing data for the purposes of fisheries management. In addition to creating a data pipeline for the collection of data from multiple mobile recreational fishing applications, the applications will be enhanced with features that motivate anglers to use the applications to report data, and outreach programs will be implemented to encourage greater reporting of data among recreational anglers in Rhode Island and surrounding areas.

Data Delivery Plan

Two recreational fishing apps will send data to the ACCSP in this proposal. AnglerCatch and FishBrain. FishBrain, has 20,000 registered users in Rhode Island and over 100,00 registered users in Massachusetts. They have logged approximately 80,000 catches last season between these two states. Because the FishBrain mobile app is a commercially targeted and monetized app, they have no desire or intentions to standardize their data to ACCSP requirements. Instead, FishBrain have requested that Harbor Light Software convert the data from their anglers into a standardized format for upload to the ACCSP SAFIS database. AnglerCatch data is already standardized to be sent to SAFIS.

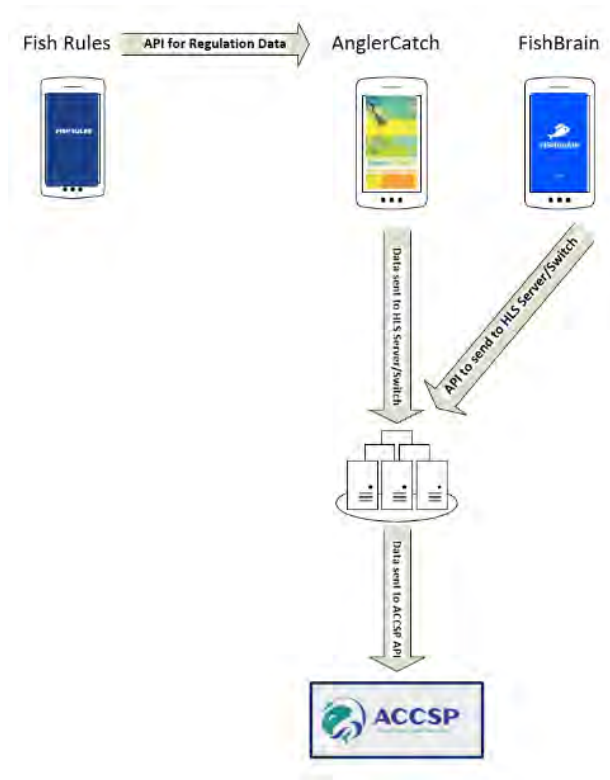
Figure 1

Possible Data Points to Upload	Mobile Application
Date/Time of Catch	AnglerCatch/FishBrain
Fish Species	AnglerCatch/FishBrain
Fishing Method	AnglerCatch/FishBrain
Fish Weight	FishBrain
Fish Length	AnglerCatch/FishBrain
Latitude	AnglerCatch/FishBrain
Longitude	AnglerCatch/FishBrain
< or > 3 miles from shore	AnglerCatch
Shore Position	AnglerCatch/FishBrain
Released/Harvested	AnglerCatch/FishBrain
Gear Used	AnglerCatch/FishBrain
Image of catch	FishBrain
State	AnglerCatch/FishBrain
Target Species	AnglerCatch/(FishBrain to add)
Note: Both apps may be able to calculate the # of times the angler has fished in the past months based on usage	

Data collected by the AnglerCatch mobile application is delivered to and collected at an AnglerCatch host server running in Microsoft Azure. Data from this host server will be transferred to SAFIS using an API based on existing SAFIS data standards and formats.

Data collected by the FishBrain application will be delivered to the Angler Catch host server, and then transferred to SAFIS using an API based on existing SAFIS data standards and formats.

Figure 2



Approach:

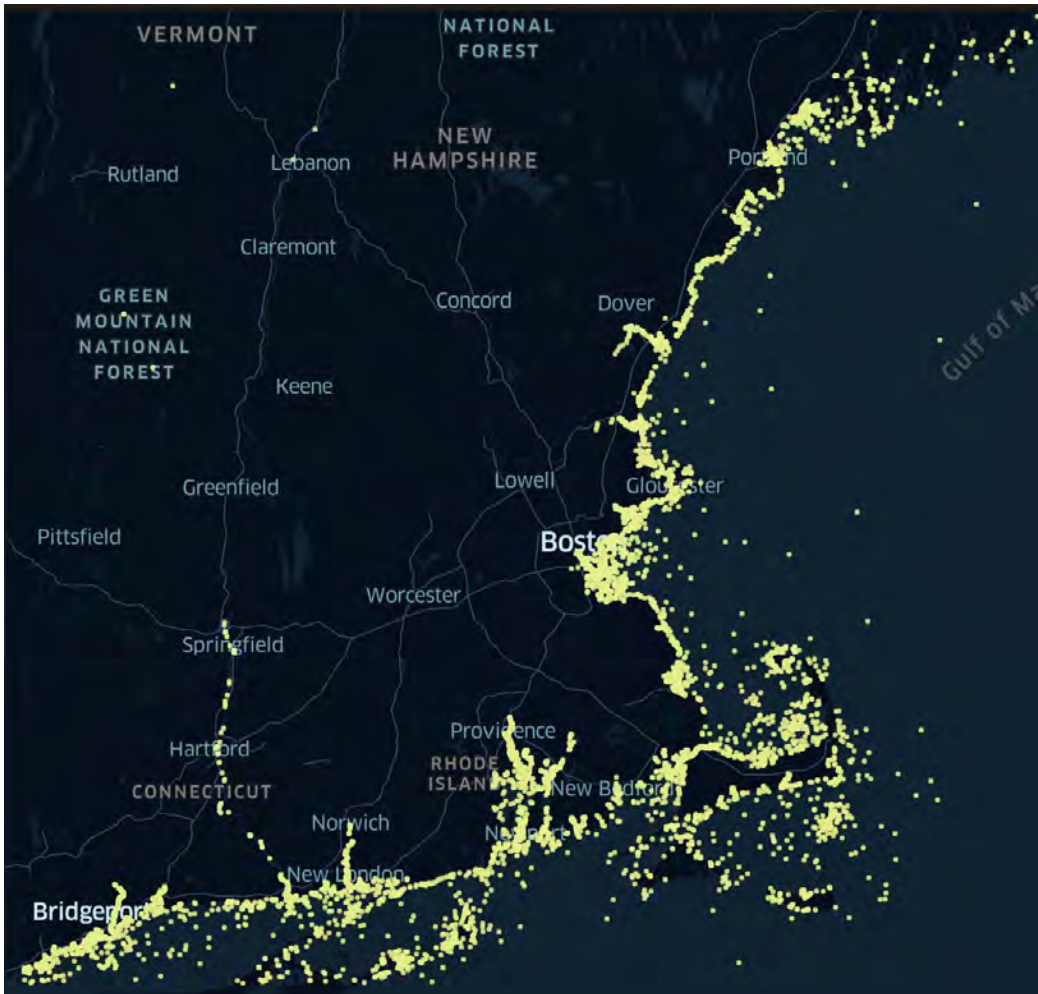
In 2021, the RIDEM teamed with the Rhode Island Saltwater Anglers Association (RISAA), and Harbor Light Software to conduct a series of ideation sessions, online workshops, focus groups and angler surveys sent to c. 7,500 affiliated members of RISAA fishermen in Rhode Island and Massachusetts. These anglers gave feedback to assist with building the AnglerCatch mobile application which delivers catch data from anglers to the RIDEM. AnglerCatch is currently in its first season of being launched by RIDMF and RISAA. To date, over 300 catch records have been received using the app.

As part of the outreach initiatives with the anglers by RISAA and RIDMF, information was gathered in the following areas:

- Which apps, if any, do recreational anglers utilize?
- What are their motivations for using a fishing app?
- What are the current trust levels of the anglers in the data being collected and how do they see their role in the process as a whole?

Fish Rules App and FishBrain were found to be the most widely used recreational fishing applications amongst the group surveyed. Fishbrain has approximately 20,000 users in Rhode Island and Massachusetts and 100,000 recreational users in Massachusetts. An example of FishBrain catch locations for this fishing season shows the last 1000 Striped Bass only catches for this area.

Figure 3.
 Catch location data for last 1000 Striped Bass Catches logged in FishBrain



Fish Rules was used primarily for understanding of fisheries Rules and Regulations, while FishBrain was used to connect with other anglers, learn new fishing techniques and as a catch logbook.

Of note, the ACCSP currently has the SciFish application that is in use by both the SAFMC and the NCDNR. The SciFish application is also a citizen science, voluntary data collection application. This application is a data collection tool that management can build and define as needed to address their individual needs. Although SciFish, FishBrain and AnglerCatch can all be classified as Citizen Science applications, there are unique differences between the three products.

SciFish	AnglerCatch	FishBrain
Gives managers the ability to quickly design and launch an app to an audience to target a	Built utilizing the ACCP data standards for things such as gears, species, fishing mode	Used by a large population of anglers. The business model is one of customer acquisition

<p>specific need in the moment. Some of the apps within SciFish may not be intended to have longevity, but instead answer questions about a specific species or regulation. Managers may limit data collection to a few species.</p>	<p>and disposition. Follows a subset of the MRIP APAIS questions. Tools such as weather, buoys, tides are given to the angler for free while guiding them to send in their catch data. Utilized by RI/MA members of RISAA and used as a fishing logbook.</p>	<p>and profit by selling upgrades within the application. Thought of as the Facebook for anglers, users connect with other users, share photos and learn new fishing techniques.</p>
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To encourage the usage of the AnglerCatch application by recreational anglers, features will be added such as ESRI-based nautical maps and enhanced historical weather-catch analysis. FishRules has developed and will provide modified APIs to share fishing regulation data amongst the logbook vendors. This will negate the need for rec anglers to use multiple apps for their fishing information.

Enhancements will be made to the functionality of the AnglerCatch host server to accept data collected by the FishBrains mobile fishing application, and software will be implemented which converts that data into a format that can be delivered to SAFIS.

In addition, funding for direct marketing campaigns to both RISAA affiliated fishing clubs and other recreational anglers in Rhode Island, Massachusetts and Connecticut would be targeted for outreach to educate anglers about the project. Outreach will be done using social media, direct marketing, distribution of hard copy materials and attending fishing organizational meetings. Anglers will become informed of how they can participate and the goals of the use of the data in recreational fishing estimates. RIDEM will assist in marketing the applications through their website and on their social media accounts.

The vendors have agreed to cross market the project on their individual platforms to increase awareness and promote the need for recreational data. Harbor Light Software and FishBrain will also provide in-kind marketing hours in the way of outreach activities such as social media posts, presentations at local fishing club meetings, and generation of promotional materials.

Geographic Location:

Waters surrounding Massachusetts, Rhode Island, Connecticut, New York, and New Jersey.

Milestone Schedule:

The milestone schedule is based on the starting month of the project as month “1.”

Task	Month												
	1	2	3	4	5	6	7	8	9	10	11	12	13
Complete requirements gathering	X	X											
Acquire APIs	X	X											
Implement inter-vendor APIs and data flow		X	X										
App Enhancements		X	X	X	X								
Marketing and Outreach					X	X	X	X	X	X	X	X	X
Data Review					X	X	X	X	X	X	X	X	X
Coordinate data feed to ACCSP		X	X	X	X	X							
Semi and Annual Report Writing						X	X					X	X

Project Accomplishments Measurement:

Project Component	Goal	Measurement
Submit data from AnglerCatch to ACCSP	Submit data from AnglerCatch to ACCSP using standard data fields and codes	Data is sent from AnglerCatch client application to ACCSP successfully and is accessible by RIDEM for analysis and review.
Collect data from FishBrain and submit to ACCSP	Collect data from FishBrain, transform into proper data fields and codes, and submit the data to the ACCSP	Data is sent from FishBrain to Harbor Light host server successfully, is forwarded to ACCSP in the correct format, and is accessible by RIDEM for analysis and review.
Enhance AnglerCatch functionality	Increase the functionality of AnglerCatch and promote submission of citizen science-based recreational fishing data to increase the quantity of available data.	Increased downloads of AnglerCatch, and increased quantity of uploaded catch data from AnglerCatch.
Outreach	Promote AnglerCatch and FishBrain as tools for submitting citizen science-based recreational fishing data.	Increased data submissions. Improved public perception of RIDEM’s fisheries management efforts.

Cost Summary:

Description	Calculation	Funding Source			Requested From ACCSP Admin Cost
		RIDEM	In-kind HLS	FishBrain	
Personnel (a)		\$2,391			\$0.00
John Lake	3% of John Lake's salary	\$2,391			
Fringe (b)		\$1,141			\$0.00
RI Fringe rate	Applied to John Lake's salary	\$1,141			
Supplies (c)		\$0.00	\$0.00	\$0.00	\$0.00
Contractual (d)		\$0.00			\$104,000
Harbor Light Software: FishBrain	264.7 hours @\$170/hour 347.1 hours @\$170/hour				\$45,000 \$59,000
Other (e)			\$5,000	\$32,500	\$30,000
FishBrain/FishRules licensing fees	a. FishRules Regulation Access License: \$2,500 / yr b. FishBrain Catch / Trip Data Access License: \$20,000/ yr c. Fish Management Products License: \$5,000/ yr.			\$2,500 \$20,000 \$5,000	
Outreach expenses and materials. Professional Marketing	200 hrs @ \$50/ hr Estimated professional Marketing fees/Printed & Incentive items	\$0.00	\$5,000	\$5,000	\$30,000
Total Direct Charges		\$3,532	\$5,000		
Indirect Charges (f)		\$689			
19.5% RI Indirect	Applied to J. Lake salary	\$689			
Totals		\$4,221	\$5,000	\$32,500	\$134,000
Total Project Cost				\$175,721	
In-kind versus Direct Percent Contributions			24%	76%	
Requested Amount				\$134,000	

Budget Narrative:

a. Personnel (0 Requested; \$2,391 Match) John Lake will provide in-kind support from RI. There is no request for Lake's salary from the ACCSP. His CV is also attached.

b. Fringe (0 Requested; \$1,141 Match) RI will provide matching funds to cover fringe for expenses associated with J. Lake's match salary.

c. Equipment/Supplies (\$30,000 Requested; \$10,000 Match)

Outreach will be done using social media, direct marketing, distribution of hard copy materials and attending fishing organizational meetings. We are budgeting \$30,000 for these activities to cover marketing consulting services, and printing of materials. This funding will be split between the vendors as needed.

d. Contractual (\$134,000 Requested; \$0 Match)

Harbor Light Software will develop software to add functionality to the AnglerCatch application, specifically adding support for ESRI nautical maps, enhanced catch analysis, integration of the FishRules API and presenting fishing regulations data, and modifications to

the user interface to make the application applicable to the broader New England region. Harbor Light will additionally enhance the existing AnglerCatch host server software to accept catch and effort data from the FishBrain application and transmit data from both sources to the ACCSP.

Fishbrain will modify the Fish Rules regulation API to be suitable for integration into the AnglerCatch app. Fishbrain will develop, maintain and optimize a new API to properly format and share catch data with Harbor Light for formatting into ACCSP standards. Fishbrain will also develop new features, product enhancements and UX improvements to Fish Management (the backend system used to update and distribute fishing regulations), including tools that allow state partners to export data (e.g. regulation views) directly from within Fish Management.

e. Other (0 Requested; \$37,500 Match)

Fish Rules regulations data license fee will be given as an in-kind for year one of the project. This is valued at \$2,500. FishBrain catch data licensing fee will be given as an in-kind for year one of the project. This is valued at \$20,000. FishBrain Fish Management Regulations license fee will be given as an in-kind for year one of the project. This is a \$5,000 value.

Harbor Light Software and FishBrain will each contribute as in-kind service, 100 hours of outreach content creation and social media activity for a total of 200 hrs @ \$50/hr, valued at \$10,000.

f. Indirect (\$0 Requested; \$689 Match)

19.5% RI indirect charges applied to John Lake's salary.

Proposal Summary for Ranking Criteria

PROPOSAL TYPE: New Project

PRIMARY PROGRAM PRIORITY:

Catch and Effort Data (100%): This project will provide RIDEM with an additional data source of catch and effort data from recreational anglers. These data will include discard lengths and other data that is not current available through other sources.

PROJECT QUALITY FACTORS

Multi-Partner/Regional impact including broad application:

Although this project focuses on activities of recreational fishermen in Rhode Island and Massachusetts, it includes the data collection of species managed regionally including striped bass, black seabass, thus, ASMFC and its partners will benefit from the catch and effort data collected from this project.

Funding Transition Plan

This project is a one-year pilot project with a defined end goal. The goal is to prove that multiple commercial vendors can submit standardized voluntary recreational catch data to the ACCSP SAFIS database to be reviewed and used by RIDEM in stock assessment and management.

In-kind Contribution:

Please see cost table on page 11. (23%)

Improvement in data quality/quantity/timeliness:

All catch and effort data collected as part of this project will be available for partners to review. Some of the data collected, such as discard lengths, is currently unavailable through the current means of data collection in the recreational sector. This data will help by providing raw discard length data and can be used to compare against data collected via the MRIP APAIS survey.

Impact on stock assessment:

The quality of stock assessments is expected to improve by providing greater quantity and quality of recreational fishing discard data on key species in the Rhode Island fishery.

Innovative:

This project is quite innovative and brings together various data sources to provide a unique insight into recreational fishing while providing data that has been difficult or impossible to obtain in the past.

Properly Prepared:

This proposal document meets the requirements as specified in the funding decision document Step2b and Guidelines.

Merit:

This proposal is particularly worthy in its quest to lessen gaps in recreational data collection while providing partners with an additional source of fisheries dependent data.

Appendix A: Curricula vitae for the principal investigators

John M Lake

13 Breton Drive
Charlestown, RI 02813
Phone: (401)377 2250
Email: john.lake@dem.ri.gov

Recent Experience

Supervising Biologist, Rhode Island Division of Fish and Wildlife August 2018 – Present, Jamestown, RI

In my current position I am the supervisor of a full-time staff of 10 and up to 10 seasonal employees at the RIDEM Division of Marine Fisheries. My duties include day to day operations, coordination of the RI recreational fishing program, program development and hearing officer.

Principal Biologist, Rhode Island Division of Fish and Wildlife July 2009 – August 2018, Jamestown, RI

I was a Principal biologist for the Rhode Island Division of Fish and Wildlife. I served as the fisheries management plan coordinator for winter flounder and Atlantic herring. I was also responsible for coordination and implementation of the NOAA Fisheries Marine Recreational Information Program (MRIP) program to collect recreational fishing data in the state. Part of this process involved the initial planning and implementation of a saltwater recreational fishing license for the state of Rhode Island. I coordinated stakeholder meetings, government contracts, website development, advertisement campaigns, legislative reports, and vendor sales. I was on a team coordinating the creation of a combination recreational hunting/fishing license. I conducted an annual juvenile finfish survey in Rhode Island's coastal ponds. I represent Rhode Island on two interagency fisheries management committees. I ran several smaller projects from small grants I have written including; shellfish conversion factor project, recreational license vendor incentive program, and piloting use of handheld data collection devices for use in Party and Charter fishing fleet. I maintained several MS Access databases and update content on the RIDFW webpage.

Fisheries Specialist 2, Atlantic States Marine Fisheries Commission February 2002 – July 2009, Jamestown, RI

This position was a contract to the Rhode Island Department of Environmental Management. I was the Rhode Island coordinator for the Atlantic Coastal Cooperative Statistics Program (ACCSP). My full-time duties included grant writing, project development, as well as design and management of three commercial fisheries data collection programs. I represented Rhode Island on five interagency fisheries management committees, including the ACCSP Operations committee. From 2003 to 2009, I wrote annual grant proposals that were awarded \$150,000 per year. I helped design the Standard Atlantic Fisheries Information System (SAFIS) and successfully put

it into operation at seafood dealers throughout Rhode Island. I designed and maintained the databases that collect Rhode Island commercial fishery statistics. I was responsible for supervising up to three employees at a time. Finally, excellent communication skills were required for this position, to routinely facilitate coordination between the public, state, and federal agencies on a suite of data management projects.

**Biological Technician, End to End Inc.
March 2001 – January 2002, South Kingstown, RI**

This position was a contract to the Rhode Island Department of Environmental Management. My duties included collecting fisheries dependent statistics from both the catch and discards of fish caught onboard commercial vessels in Rhode Island. I calculated aging statistics for commercially important finfish. I data entered commercial lobster catch logbooks. I was responsible for annual report writing and setting up purchase orders for supply requisition. I would also frequently assist other field projects carried out on small vessels within Narragansett Bay, Rhode Island.

Education

University of Connecticut, Storrs, CT
Master of Science, Biological Oceanography, March 1997

Relevant Coursework: Biological Oceanography, Marine Biogeochemistry, Physical Oceanography, Geological Oceanography, Applied Statistics 1-2, Principles of Fisheries Management, Zooplankton Ecology

Thesis Research: Diet Selectivity of Scup, (*Stenotomus chrysops*), in Long Island Sound. Graduate level research involving experimental design, field work, laboratory work, and statistical analysis. Patterns of Scup diet were determined relative to ontogenetic development, Western Long Island Sound hypoxia, and external morphology.

College of the Holy Cross, Worcester, MA
Bachelor of Arts, Biology, May 1991

Relevant Coursework: Cell Biology, Genetics, Biochemistry 1-2, Immunology, Animal Physiology, Marine Biology/Ecology 1-2, Organic Chemistry 1-2, General Chemistry 1-2, Introduction to Biology, Physics 1-2, Invertebrate Zoology, Botany, Calculus 1-2, Methods of Teaching.

Job Related Certifications:
SQL Programming April 30, 2008
At Sea Safety Training, June 2007
Power Squadron Safe Boating and Navigation June 1999

Additional Skills:

I possess exceptional computer skills and am competent in a wide variety of software packages. These packages include MS Access, MS Excel, MS Word, Oracle Discoverer Plus, and SQL Developer. I can program in Visual Basic and SQL. I also maintain a current state of New Hampshire safe boating certificate.

Funding Proposal

FY23 ACCSP Accountability Work Group

Applicant Name: Atlantic States Marine Fisheries Commission

Project Title: Support for ACCSP Accountability Work Group Recommendation Implementation

Project Type: New Project

Principal Investigator: Geoff White, Director, ACCSP

Collaborators: Julie DeFilippi Simpson, ACCSP and Accountability Work Group

Requested Award Amount: \$49,976

Requested Award Period: One year upon receipt of funds

A. Objectives

1. Conduct a Best Practices Workshop for data providers to compare data collection programs, audits, and trips/dealer reports and to identify and share funding resources for development and implementation of technological advances.
2. Facilitate ACCSP and data providers review of data element/field definitions to make sure they are as comprehensive as possible, including indicating the reliability of each field.

B. Need

A Data Accountability Work Group (AWG) was formed in 2020 to address several tasks from the Atlantic Coastal Cooperative Statistics Program (ACCSP) Coordinating Council in regard to fisheries data quality, accountability, verification, and use for the US Atlantic Coast. The AWG was tasked with evaluating the practices and procedures currently in use and reviewing and updating the ACCSP standards as needed. The AWG recognized that further work was necessary before updates to the standards were addressed. Based on comments collected from data managers and consumers through surveys and the discussion within the AWG, a number of recommendations were proposed to improve communication of data limitations and provide opportunities for jurisdictions and sectors to expand and streamline processes. The [AWG report](#)

Underlined statements help with the ranking process.

Support for ACCSP Accountability Work Group Recommendation Implementation

outlines all 9 of these recommendations along with specifics of the surveys conducted and those results.

Since the writing of the report, the AWG has met to prioritize those recommendations and determine which ones were appropriate for action first. Three (3) top priority recommendations were identified and have been adapted as the objectives for this project. A collaborative and interactive workshop that allows partners to discuss, share, review, and prioritize is the vital first step in addressing the recommendations of the AWG and will serve as the foundation upon which future actions are based.

C. Results and Benefits

The results of this project will allow the AWG and other ACCSP groups as deemed necessary to undertake the remaining recommendations outlined in the AWG report. Addressing these recommendations will allow for an update to the ACCSP standards to reflect the current best practices for both data validation and provisioning. This directly responds to the problem statement put forth by the Coordinating Council at their March 12, 2019 meeting.

Data validation and accountability issues can compromise data quality and reduce their utility for stock assessments, compliance reports, and other management activities.

The concept was based on a forward thinking approach toward data quality and maximizing the value of the investment of ACCSP and partner staff time and resources in data warehousing. The idea of data accountability was to have a standardized mechanism or approach to verify that data reflect what is happening on the water and at the docks. The Coordinating Council considered that data clerks entering paper data provided an initial check of data. While there are advantages to the shift to electronic forms, the loss of the data entry clerk presents a need for additional data verification and auditing. This project and workshop will more fully explore the components of electronic at-entry data validation, auditing, and comparison to alternate data streams to assess overall accountability.

D. Data Delivery Plan

Documentation of the workshop in the form of a workshop report will be made available on the ACCSP website in a timely fashion following the meeting. This report, along with other meeting products, will be made available to the AWG and any other ACCSP groups that will be addressing the remaining recommendations from the AWG report.

E. Approach

1. AWG members will meet to determine the feedback and data needed from data providers and consumers prior to the meeting. (Objectives 1 and 2)
2. AWG members, data providers, data consumers, and other relevant parties will provide feedback and compile materials for review. (Objective 2)
3. Virtual sessions will be held as needed to prepare for the in-person workshop. (Objective 2)
4. A multi-day in person workshop will be held with facilitated plenary and breakout sessions to review, compare, and evaluate various approaches to catch and effort data collection and audits. Activities will be based on pre-meeting virtual feedback and will utilize appropriate Quality Management and Continuous Improvement tools. All sessions, including breakouts will have a note taker. (Objective 1 and 2)
5. The results and products of the workshop will be compiled into a final report. (Objective 1 and 2)

F. Geographic Location: Atlantic Coast (Maine through Florida)

G. Funding Transition Plan

This proposal is to host a series of virtual meetings and a single in-person workshop and is a single year proposal. The results of this project will serve as the foundation upon which the AWG and other ACCSP groups can address the remaining recommendations of the original report. At this time, the remaining action items have not been scoped from a needed funding perspective. Internal ACCSP funds and other sources of funding will be explored at that time prior to putting forth another proposal.

H. Milestone Schedule

Activity	Month												
	1	2	3	4	5	6	7	8	9	10	11	12	13
AWG scoping	X	X	X										
Feedback and materials gathering			X	X	X	X	X	X					
Virtual pre-meeting sessions						X	X	X	X				
In-person workshop										X			
Workshop report writing											X	X	
Semi and Annual report writing						X	X					X	X

Underlined statements help with the ranking process.

Support for ACCSP Accountability Work Group Recommendation Implementation

I. Project Accomplishments Measurement

Objective	Measurement
Conduct a Best Practices Workshop for data providers to compare data collection programs, audits, and trips/dealer reports and to identify and share funding resources for development and implementation of technological advances.	Realization of a multi-day in-person workshop with facilitated plenary and breakout sessions to review, compare, and evaluate various approaches to catch and effort data collection and audits
Facilitate ACCSP and data providers review of data element/field definitions to make sure they are as comprehensive as possible, including indicating the reliability of each field.	Comprehensive meeting materials that are compiled in an easily digestible fashion and reflect the feedback and perspectives of all participating partners.

J. Budget:

Budget Summary	Description	Proposal	In-kind
Contract	Meeting facilitator		\$20,000
Travel	30 participants x 5 days x \$275	\$41,250	
Supplies	Meeting facilitation supplies	\$1,000	
Other	Meeting room costs	\$2,000	
Total Project		\$44,250	
ASMFC Overhead (12.94%)		\$5,726	
Total Proposal		\$49,976	\$20,000
		71%	29%

K. Budget Narrative

NOTE: This proposal is separated from the ACCSP ADMIN grant as a priority item for progress that is not part of the ongoing travel budget. This approach allows for separate evaluation and full transparency.

Personnel

All members of the AWG, listed below, will be dedicating a significant amount of their time to this effort. However, as those efforts are part of the larger project to which they have

Underlined statements help with the ranking process.

Support for ACCSP Accountability Work Group Recommendation Implementation

volunteered their time, hours dedicated to this portion of the work have not been tallied as part of the in-kind contribution.

Kristen Anstead, Atlantic States Marine Fisheries Commission
Nichole Ares, Rhode Island Department of Environmental Management
Heather Baertlein, NOAA Fisheries
Lauren Dolinger-Few, NOAA Fisheries
Eric Hiltz, South Carolina Department of Natural Resources
Matthew Maiello, NOAA Fisheries
Julie DeFilippi Simpson, Atlantic Coastal Cooperative Statistics Program
David Ulmer, NOAA Fisheries
Rob Watts, Maine Department of Marine Resources
Anna Webb, Massachusetts Division of Marine Fisheries
Jackie Wilson, NOAA Fisheries

Contractor

Facilitation will be provided by the Fisheries Information Systems Quality Management and Continuous Improvement Professional Specialty Group or the NOAA Facilitation Network. This resource is available because of the involvement in these groups by the ACCSP Deputy Director. A facilitator capable of leading small group sessions where specific topics can be covered and then full group sessions where small groups report out for a meeting of this length would cost an additional \$20,000 if a contractor was hired.

Travel

The travel budget is based on an ASMFC average estimated \$275 per day multiplied by number of meeting days multiplied by non-federal expected attendees plus staff. The in-person meeting is scheduled for 5 days to allow a sufficient amount of time to comprehensively cover the desired topics in-depth in small group settings and have higher level summarized conversations and decision making as needed in full plenary sessions. This time frame is based on other similar scientific and data fisheries meetings, such as stock assessment data workshops. More specifically, this time frame is the same as best practices workshops that have been held by SEDAR/SAFMC.

Supplies and Other Costs

In addition to the cost of the room(s) necessary to host a meeting that includes breakout sessions, facilitation of these types meetings will require materials for interactive sessions such as flip charts, markers, sticky notes, paper rolls, posters, and other supplies.

L. Summary for Ranking

Proposal Type

New

Primary Program Priority

100% Catch and Effort

Data Delivery Plan

A workshop report and other potential workshop products will be made publicly available through the ACCSP website.

Project Quality Factors

Multi-partner/Regional impact including broad application

This project includes all ACCSP partners across the entire region. The results of this workshop will be used to adapt the Atlantic Coast Standards, which have a significant impact on the Northeast, Mid-Atlantic, and Southeast regions.

Contains funding transition plan

This project is intended to be a single year of funding. As the need for future feeding may arise the AWG intends to seek alternative funding sources and leverage ACCSP internal funds prior to putting in another proposal.

In-kind contribution

The quantitative in-kind contribution is possible because of the involvement of the ACCSP Deputy Director's in Fisheries Information Systems and the Quality Management and Continuous Improvement Specialty Group. The total project costs of \$69,976 include \$20,000 (29%) of in-kind services.

Improvement in data quality/quantity/timeliness

This project is carrying out recommendations of the AWG report, which addressed the problem put forth by the Coordinating Council of "Data validation and accountability issues can compromise data quality and reduce their utility for stock assessments, compliance reports, and other management activities".

Potential secondary module as a by-product

There is no secondary module.

Impact on stock assessment

The responses from the data user survey helped the AWG to identify several issues. Examination of these issues led to the belief that the core of the issue was not the data, but rather communication between the data providers and users. Recommendations were developed by the group aimed at improving communication between these two groups. These recommendations include the workshop that is the core of this project.

Other factors

Innovating

Best practices workshops as a specific event have not previously been held by ACCSP, despite that numerous meetings and work have been directed to establishing best practices. This is a novel approach by ACCSP to streamline and minimize the burden on partners by consolidating the discussions and work to a few virtual meetings and a single week of in-person attendance.

Properly prepared

This proposal follows the guidelines and formats put forth in the ACCSP Funding Decision Process Document.

Merit

This project is a direct result of a report from a working group that was formed to respond to a charge from the Coordinating Council. It is a single year directed use of funds to forward the primary mission of the ACCSP and address the needs of the partners.

Geoff White

ACCSP Director



EXECUTIVE COMPETENCIES

- Committed to excellence and accountability
- Empowering leadership and inclusive management style
- Leveraging technology and cooperative approach
- Belief in holistic and integrated solutions
- Passion for strategic vision
- Project design and oversight
- Financial responsibility and accountability
- Effective communicator, writer and presenter
- Proven ACCSP ambassador

10836 Tuckahoe Way
N. Potomac, MD 20878
Home: (301) 838-2856
Mobile: (301) 706-1804
Geoff.White@ACCSP.org

SELECTED ACHIEVEMENTS

- Supported reduced fishery reporting burden through One Stop Reporting.
- Improved efficiency of APAIS data collection by integrating tablet data capture, Oracle database, SAS processing and delivery.
- Extended state conduct of MRIP FHTS and LPS with integrated web tools.
- Developed budget and managed over \$4.5M annual funding for multiple MRIP surveys through ACCSP and 13 State Partners
- Initiated development of comprehensive for-hire data collection methods.
- Developed and implemented the MRIP APAIS Atlantic state conduct transition
- Conceived and implemented changes to improve availability of ACCSP data

EMPLOYMENT EXPERIENCE

Director, ACCSP 2019 – Present

Responsible for ACCSP strategic direction through the Coordinating Council, and management of ongoing projects. Represent ASMFC and Atlantic states on data related topics in regional and national meetings.

Recreational Program Manager ACCSP 2015 – 2019

Responsible for ACCSP's recreational fishery data standards and implementing state conduct of MRIP APAIS and FHTS surveys. Developed coastwide budgets, data collection, processing, and delivery systems. Managed local staff and guided partner staff in survey completion. Represented ACCSP and Atlantic states on MRIP Regional Council and at national meetings.

Data Team Lead / Systems Admin ACCSP 2008 – 2015

Provided data team leadership and subject expertise for ACCSP data projects and priorities. Engineered transition to state conduct of MRIP APAIS. Responsible for ACCSP information systems maintenance including network, servers, oracle databases, and 2010 office relocation.

Systems Admin -ACCSP 2004-2008

Responsible for the ACCSP's IT infrastructure. Provided subject expertise for partner data access, data translations, and development of web-based recreational and commercial queries.

Fisheries Specialist -ASMFC 1998-2004

Coordinated SEAMAP SA, staffed development of two multi-species assessment models, designed and implemented the Lobster Assessment Database, coordinated fisheries research programs and stock assessment reviews supporting fisheries management.

Marine Scientist -VIMS 1996-1998

Estimated fishing mortality of tautog in Virginia waters. Project results accepted as Virginia's fishery status in the ASMFC Tautog FMP.

MANAGEMENT EXPERIENCE

- Managed multiple concurrent projects and contracts to extend ACCSP capabilities.
- Contributing member of MRIP Regional Implementation Council & MRIP NAS reviews.
- Extended development of the MRIP survey state conduct through leadership of three local staff and 160 remote partner staff.
- Coached RecTech Committee development of Atlantic Recreational Implementation Plan.
- Supported Cooperative agreement funding and management, including proposal writing, information gathering, contract oversight, and report submission.
- Demonstrated ability to bring together diverse groups on issues by coordinating and facilitating workshops.

FISHERIES EXPERIENCE

- Deep understanding of the ACCSP mission, activities, and partners gained over 24 years of working in consensus-driven environment of Atlantic coast fisheries management
- Adept at balancing state and federal partner needs in the development of coastwide data standards, data entry and query tools for recreational and commercial fisheries data
- Proven ability to understand fisheries stock assessment data needs

IT EXPERIENCE

Software Development – Strategic priorities for SAFIS capabilities. Managed and programmed projects to create Data Warehouse end user queries, APAIS web interface, APAIS Tablet application, API data transmission and FHTS CATI.

Oracle DBA – Managed 10 DB instances supporting coastwide standardization of fisheries data collection and dissemination.

Systems Administrator– Performed or directed data center implementation and support including network security & system availability.

EDUCATION & AWARDS

- B.S. Dickinson College
- M.S. Virginia Institute of Marine Science
- ASMFC Stock Assessment Training I-III
- Oracle PL/SQL, DB Administration, Windows & Linux Server Administration
- Project Management & Leadership Training
- ASMFC Employee of the Qtr 2003, 2011
- ASMFC Directors Meritorious Service 2017
- ASMFC Science & Technical Excellence 2019
- Eagle Scout, Boy Scouts of America



Atlantic Coastal Cooperative Statistics Program

1050 N. Highland Street, Suite 200A-N | Arlington, VA 22201
703.842.0780 | 703.842.0779 (fax) | www.accsp.org

June 15, 2022

To the members of the Operations and Advisory Committees:

The FY2023 Administrative Budget contains a few changes. ACCSP leadership has made concerted efforts to maximize the potential of the administrative budget by finding additional sources of funding, which are outlined at the end of the proposal. We are also exploiting opportunities to gain efficiencies, which is evidenced in the budget reductions found in travel and internet connectivity. Additionally, the ASMFC has decreased its overhead rate from 16.81% to 12.94%. All of these efforts have resulted in a decrease in the Administrative Budget compared to FY2022.

Attachment I of the FY2023 Administrative Budget request, the 2019 ASMFC Strategic Plan (Goal 3), provides an overview of the high level tasks and milestones expected for the coming year.

Sincerely,

Geoff White

ACCSP Director

Funding Proposal
FY23 ACCSP Administrative Budget

Applicant Name: Atlantic States Marine Fisheries Commission

Project Title: Administrative Support to the Atlantic Coastal Cooperative Statistics Program

Principal Investigator: Geoff White, Director, ACCSP

Requested Award Amount: \$2,206,609

Request Type: Maintenance/Administrative

Requested Award Period: March 1, 2023 through February 28, 2024

A. Goals

The Atlantic Coastal Cooperative Statistics Program (ACCSP) is a state-federal cooperative partnership between 23 entities responsible for fisheries management, and fisheries data collection on the Atlantic Coast: the 15 Atlantic coast states and the District of Columbia, two federal fisheries agencies (Commerce's NOAA Fisheries and Interior's U.S. Fish and Wildlife Service), three regional fisheries management councils (New England, Mid-Atlantic, and South Atlantic), the Potomac River Fisheries Commission, and the Atlantic States Marine Fisheries Commission (ASMFC). Partner agencies are listed in the original [ACCSP Memorandum of Understanding](#).

The Program was established in 1995 to design, implement, and conduct marine fisheries statistics data collection programs and to integrate those data into a single data management system that will meet the needs of fishery managers, scientists, and the general public.

By establishing and maintaining data collection standards and providing a data management system that incorporates state and federal data, ACCSP will ensure that the best available statistics can be used for fisheries management.

B. Objectives

1. Manage and expand a fully integrated data set that represents the best available fisheries-dependent data;
2. Continue working with the program partners to improve fisheries data collection and management in accordance with the evolving ACCSP standards within the confines of limited funds;

3. Explore the allocation of existing Program funds and work with partners to pursue additional funding;
4. Maintain strong executive leadership and collaborative involvement among partners at all committee levels;
5. Monitor and improve the usefulness of products and services provided by the ACCSP;
6. Collaborate with program partners in their funding processes by providing outreach materials and other support to demonstrate the value of ACCSP products and the importance of maintaining base support for fishery-dependent data collection programs to state partners and their executive and legislative branches as well as to all other partner agencies; and,
7. Support nationwide systems as defined in the Magnuson-Stevens Fishery Conservation and Management Act (MSA).

C. Need

Various state and federal fishery management agencies on the Atlantic coast collect data on the status and trends of specific fish populations and the fisheries that utilize these resources; however, it is often difficult to develop sound recommendations to fisheries managers due to inconsistencies in the way data are collected and managed. The various data sets often cannot be integrated to provide accurate information at the state, regional, or coast-wide level. In addition, the disparate manner in which these data are collected and managed places duplicative burdens on fishermen and dealers reporting to multiple state and federal agencies and regions. Due to rapidly changing stock conditions, within-season regulatory changes and catch quotas have become common fishery management strategies. Timely and accurate harvest information for both recreational and commercial fisheries is required to determine the need for and effects of these management measures.

The [Atlantic Coastal Fisheries Cooperative Management Act of 1993](#) mandated a cooperative state-federal program for the conservation of Atlantic coastal fisheries. Section 804 of the Act requires the Secretaries of Commerce and the Interior to develop a program to support state fisheries programs and those of the ASMFC, including improvements in statistics programs. Since the mid-1990s, the ASMFC has provided administrative support for this coordinated effort to improve data collection and management activities.

In 1995 the states, the ASMFC, and the federal fishery management agencies on the Atlantic coast entered into a Memorandum of Understanding (MOU) to develop and implement a cooperative state-federal statistics program that would meet the management needs of all participating agencies. All program partners signed the MOU for the ACCSP at the Commission's 54th Annual Meeting in Charleston, SC. Following signing, an Operations Plan was developed to outline the specific tasks and timetables required to develop and initiate implementation of this program. In October of 2016, an updated MOU was approved that made the ACCSP a program of the ASMFC. This governance change integrates the long-term and annual planning processes with those already in existence for the ASMFC and conform to policy as set by the ACCSP Coordinating Council.

D. Results and Benefits

The ACCSP developed and adopted 1999, 2004 and 2012 versions of the Program Design (now renamed [Atlantic Coast Fisheries Data Collection Standards](#)), which document the standards and protocols for collection and management of commercial, recreational, and for-hire fisheries statistics. Program partners developed and approved minimum data elements for collection of catch, effort, biological, social, and economic statistics. The ACCSP also developed standard codes and formats to ensure consistency of all data collected under the Program. These standards require periodic review and revision as the needs of fisheries managers and the state of the art of fisheries science change.

In 2000, the first version of the [Data Warehouse](#) was made available to the program partners. Since then, it has grown to encompass almost a 70 year time series of fisheries-dependent catch and effort data. Loading of biological data has begun. These data are constantly reviewed and updated as needed.

In 2004, the first version of the [Standard Atlantic Fisheries Information System \(SAFIS\)](#) eDR (electronic dealer reporting) was deployed, followed in 2008, by eTRIPS (electronic trip reporting). This system is used to collect data from commercial and recreational fishermen and dealers and is now deployed from Maine to Georgia. SAFIS is an ongoing and evolving system, requiring support, review, and revision.

The ACCSP will continue to reduce duplication of effort by dealers and fishermen, make more efficient use of limited funds, promote education of resource users, and provide a more complete information base for formulating management policies, strategies, and tactics for shared resources. An integrated multi-agency program using standard protocols for reporting compatible information will lead to more efficient and cost-effective use of current federally and state funded data collection and management programs. The ACCSP will reduce the burden on the fishing industry to provide information in multiple formats to multiple agencies, and will provide more accurate and timely information to achieve optimum public benefits from the use of fishery resources along the Atlantic coast. The ACCSP will ensure the timely dissemination of accurate data on commercial and recreational fisheries for use in stock assessments and fisheries management through a comprehensive and easily accessible data management system.

E. Approach

The ACCSP is managed collaboratively by committee: the Coordinating Council, composed of high level fisheries policy makers from all the program partners, is the governing body; the Operations Committee provides guidance in standards setting and funding priorities. An Advisory Committee provides industry input into the process. A number of other technical committees provide input into various aspects of the process.

Program planning builds on basic principles related to the goals stated in the ACCSP MOU:

- Development of data collection standards and the implementation of data collection programs will be done cooperatively, across jurisdictional lines;
- Consistent coast-wide data collection standards will be implemented by all program partners that include data on all fishing activities -- commercial, recreational and for-hire fisheries;
- Once achieved, data collection improvements will be maintained;
- These data will be loaded and maintained in a central data repository and provided to data users through a user-friendly query system;
- Program planning will be done collaboratively, by consensus;
- The program will be responsive and accountable to partner and end-user needs; and
- Focus on activities that yield maximum benefit.

Goal 3 of the ASMFC Strategic Plan (Attachment I) details activities to be conducted by ACCSP staff and committees under the FY23 Administrative Budget. As a program of the ASMFC, administrative support of ACCSP activities is funded through indirect charges of all ACCSP awards, including the Administrative Grant. Note that program activities and staff in support of the Marine Recreational Information Program are separately funded and therefore not included in this plan.

The ACCSP initially developed common standards collaboratively, by consensus, then began to work with program partners to implement the standards, according to a commonly agreed upon priority. All ACCSP technical committees, except for the Advisory Committee which is composed of industry and recreational representatives, are comprised of managers and staff of the partner agencies and set policy by consensus. Only the Coordinating Council votes directly on motions.

The standards, known as the [Atlantic Coast Fisheries Data Collection Standards](#), for data collection and management are developed and maintained by ACCSP Technical Committees, with review and oversight by the Operations Committee, and advice from the Advisory Committee. The ACCSP Coordinating Council makes policy level decisions to adopt the program standards. The full-time ACCSP staff coordinates all activities conducted by the ACCSP.

The [Atlantic Coast Fisheries Data Collection Standards](#) documents all completed standards and provides the basic framework for full implementation of the ACCSP by all program partners. The ACCSP is continuously evolving as technology and the needs of management and science change over time. Therefore the *Standards* and supporting systems are always developing. Support for the implementation of ACCSP modules is provided by staff in various jurisdictions. To this end, funding is required to provide for full-time staff for all ACCSP activities, as well as for travel and meeting expenses.

The ACCSP Director, reporting to the Executive Director of the ASMFC, provides leadership for the Program, overall programmatic management and guidance, and is responsible for the day-to-day operations. The ACCSP Deputy Director supports the ACCSP Director on operation and development of the Program and is responsible for managing the competitive ACCSP funding process, coordinating cross-team project management, and providing support for a wide range of Program activities. The ACCSP Program Assistant provides assistance to the ACCSP Director and ACCSP Deputy Director, provides staff support for program and technical committees by drafting, maintaining and coordinating program documents, and publicizes the availability and benefits of the Program. The ACCSP IT Manager manages the information systems infrastructure and security and jointly coordinates the development and management of ACCSP data collection systems with the ACCSP Deputy Director. The Data Team Leader provides guidance for data compilation and dissemination related activities. The Recreational Team Lead coordinates MRIP survey implementation and recreational and for-hire data standards. The Data Coordinators and Developers provide programming services and system support required to develop and fine-tune the data management systems, assist users as they access the system and provide quality management and control. The Data Coordinators also complete custom data requests, QA/QC existing data, maintain data feeds, and directly participate in data intensive activities such as a stock assessment data workshops. The Software Team staff provides expert consultation to partners as they implement new reporting, and licensing/permitting systems. The Software Team will continue to support development of SAFIS.

ACCSP staff will follow Goal 3 of the ASMFC 2019 Strategic Plan during FY23, in consultation with all partners. Specific tasks to be accomplished during the period include initiation and maintenance of Partner data feeds from the commercial, recreational, and biological modules; implement registration tracking component of SAFIS redesign; maintenance of Federal Information Security Management Act procedures; and support of other partner projects by providing technical expertise as necessary.

The ASMFC has basic responsibility for the logistics of all committee meetings which support the development of the ACCSP, including: the ACCSP Coordinating Council, the ACCSP Operations Committee, the Advisory Committee, the Recreational Technical Committee, the Commercial Technical Committee, the Information Systems Committee, the Biological Review Panel, the Bycatch Prioritization Committee, the Standard Codes Committee. Full-time ACCSP personnel staff these committees for planning of work, providing minutes and other documents, and other follow-up.

The ACCSP has helped foster an improved atmosphere of cooperation among its partners. The Program has succeeded in establishing coast-wide fisheries data standards that all program partners have agreed to adopt. Data collection and management systems will be developed and deployed and maintained as the standards and Partner needs evolve. Program partners remain engaged in the process, and the program has made substantial progress towards its goals.

1. Geographic Location: Atlantic Coast (Maine through Florida); eTRIPS software is deployed in the Gulf of Mexico as part of the SERO For-Hire Program

2. Milestone Schedule: See Goal 3 of the ASMFC 2019 Strategic Plan (Attachment I)

This is a continuation from previous projects. Table 1 contains the base administrative budget amounts by year since implementation began in 1999.

Table 1. Administrative funding for ACCSP from 1999-2022

Year	Funding	Number of Staff
1999	\$907,902	3
2000	\$681,451	3
2001	\$1,054,466	5
2002	\$1,178,677	6
2003	\$1,302,768	7
2004	\$1,298,319	8
2005	\$1,409,545	8
2006	\$1,380,598	8
2007	\$1,489,189	8
2008	\$1,447,620	9
2009	\$1,527,996	9
2010	\$1,509,899	9
2011	\$1,530,699	9
2012	\$1,509,555	9
2013	\$1,582,780	9
2014	\$1,718,447	9.5
2015	\$1,731,666	9.5
2016	\$1,623,360	9.5
2017	\$1,855,113	9.5
2018	\$1,854,249	9.5
2019	\$1,816,503	9.5
2020	\$2,012,744	11
2021	\$2,069,244	12
2022	\$2,224,272	13

3. Cost Summary: The ACCSP requests \$1,957,788 for administrative support, committee travel and systems operations during FY23. The addition of the 12.94% indirect rate raises the request to \$2,211,126. The decrease in request from FY22 reflects an alternative funding source for the ACCSP help desk and FISMA, and the retirement of the Software Team Lead, duties assumed by ACCSP IT Manager and ACCSP Deputy Director, and replacement with a Software Programmer.

The funds used for the ACCSP shall be accounted for separately from all other ASMFC funds.

4. Personnel

Program personnel funded through this grant, except the Recreational Team Lead, are dedicated 100% to the ACCSP and are full-time employees of the Atlantic States Marine Fisheries Commission. Note that personnel associated with the MRIP state conduct and 85% of the Recreational Team Leader are funded under separate authority and not accounted for in this document. Fringe benefits which include health care, vision, dental, annual and sick leave are calculated at 28%. ASMFC salaries are kept confidential, thus only totals are displayed. Additionally, an agreement has been put in place with NMFS Highly Migratory Species (HMS) to partially fund the Information Systems Specialist responsible for maintaining HMS data feeds. The addition of a software development position would transition some contract support for mobile software maintenance to staff role.

- ACCSP Director - Geoff White
- ACCSP Deputy Director – Julie DeFilippi Simpson
- Program Assistant – Marisa Powell
- ACCSP IT Manager and Software Developer – Edward Martino
- Recreational Team Lead (15%) – Alex DiJohnson
- Software Developer – Jamal Oudiden
- Software Developer – Daniel Mestawat
- Software Developer – VACANT
- Data Team Lead – Michael Rinaldi
- Data Analyst - Jennifer Ni
- Senior Data Coordinator – Joseph Myers
- Senior Data Coordinator – Heather Konell
- Data Coordinator – Anna-Mai Christmas-Svajdlenka
- Data Coordinator – Adam Lee

Salaries and Wages	
Total Salary	\$ 1,321,846
Benefits @28%	\$ 370,117
Total Costs	\$ 1,691,962

5. Travel

Travel is broken down into two general categories; committee meetings and staff travel. The bulk of travel is in support of committee meetings. While significant savings have been achieved by using remote meeting technologies (such as online meetings), face-to-face meetings are often required to complete the tasks assigned. In general, each committee will have at least one face-to-face meeting during the year. In addition to staff travel to support committee meetings, staff travel is needed for implementation planning, data collection activities, outreach efforts, and information system development meetings with partners.

The Program funds fares to and from the meeting site, per diem according to Office of Personnel and Management guidelines and facilities costs for the meeting itself. (The daily rate per meeting includes cost of airfare or mileage, lodging, meals and other travel related expenses.) Reimbursable participants include state fisheries directors and biologists, state and university scientists, law enforcement personnel and citizen advisors from Maine through Florida. Meetings will be held in various locations on the Eastern Seaboard, including but not limited to: Annapolis, MD; Norfolk, VA; Charleston, SC; Philadelphia, PA; Alexandria, VA; Providence, RI; Jacksonville, FL; Washington, D.C.

The travel budget is based on an ASMFC average estimated \$275 per day multiplied by meetings multiplied by days multiplied by non-federal membership plus staff.

In FY2023, there is a higher likelihood of in-person meetings considering the desire to interact in response to the lack of in-person interaction due to COVID. In addition, travel is currently more expensive than the previous calculated average. However, less meetings were held in-person in FY22 than anticipated. As such, travel costs are consistent with the previous year as the carry-over will cover additional expected costs in FY2023.

Committee Travel	Meetings	Days	Membership	Total	Staff	Total	Grand Total
Biological Review panel	1	1.5	15	\$6,188	1	\$413	\$6,600
Bycatch Prioritization	1	1	15	\$4,125	1	\$275	\$4,400
Commercial Technical Committee	1	1	15	\$4,125	1	\$275	\$4,400
Coordinating Council (with ASMFC)	2	0.5	12	\$3,300	2	\$550	\$3,850
Operations and Advisory Committees	1	2.5	20	\$13,750	2	\$1,375	\$15,125
Recreational Technical	1	2	15	\$8,250	1	\$550	\$8,800
Information Systems Committee	1	1	15	\$4,125	1	\$275	\$4,400
Total Committees				\$43,863		\$3,713	\$47,575
Staff Travel							
Partner Coordination	5	2	2	\$5,500			
Data Support (Stock Assessment etc)	1	5	2	\$2,750			
IT/SAFIS Support	3	1	1	\$825			
Outreach/Training	4	1	1	\$1,100			
GulfFIN Coordination	2	1.5	1	\$825			
Staff Training	2	4	2	\$4,400			
Total Staff Travel				\$15,400			
Grand Total							\$62,975

Attachment II provides the FY22 schedule of the funding cycle and calendar of meetings, which serves as a tentative schedule for FY23.

6. Supplies

Supply costs include supplies not covered by the ASMFC indirect. This includes ACCSP specific materials for outreach, smaller information systems items such as network switches and cables.

Supplies	
Misc Hardware (cables, network hubs etc)	\$4,651
Backup Tapes	\$1,000
Total	\$5,651

7. Equipment

ACCSP maintains several large server systems and related hardware in support of the Data Warehouse, website, SAFIS and administrative functions. These systems typically have a 5 year life cycle after which they require upgrade or replacement. In cases of the larger items, lease options have been explored, but it appears that, in part due to current staffing, it is more cost effective to own and maintain the equipment internally.

Included in the costs are normal life cycle replacements of laptop and desktop systems, assuming replacement of 3 systems annually. Costs are based upon current market surveys and an estimate of our needs. In FY23, we will require replacement of two servers.

Equipment	
Infrastructure Replacements (two servers)	\$12,000
Desktop/Laptop Systems	\$ 4,500
Total	\$16,500

8. Other Costs

Hardware and software support are supplied by a number of different vendors and includes costs associated with licensing and maintenance fees (such as *Oracle* licensing).

The Program maintains a high speed internet connection and associated infrastructure in support of the server systems. The primary internet connection is covered by ASMFC. The second connection, using an entirely different technology and provider provides redundancy to the

primary connection in case of failure. The system is configured to automatically fail over in the event of a failure of the primary internet connection. A previously maintained ACCSP funded connection dedicated to the NOAA Fisheries Greater Atlantic Regional Fisheries Office (GARFO) to provide full time secure connectivity requested by the Region has been replaced with a VPN connection through NOAA’s OCIO office. Coordination of ACCSP with the OCIO has resulted in a permanent decrease in costs in this area by about \$10,000.

Outside vendors include Hewlett Packard for systems hardware and software support; Oracle for database management systems support; DLT Solutions and Trident Solutions for hardware support. All pricing is based on the GSA schedule.

Software maintenance and development workload at times exceeds staff’s resources. Contract services will be utilized to provide services that staff may be unable to perform.

E-Reporting Support

Funds are requested for electronic reporting outreach and support activities. Interest among state Partners and harvesters has been steadily rising and a steady stream of new users are adopting the system where agencies will accept electronic reports though SAFIS. In addition, recent and pending management actions mandate electronic reporting. SAFIS eTrips in both the mobile and on-line versions are likely to be used by the majority of harvesters as the reporting tool. This will be especially true in FY2022 and FY2023 as eTRIPS will be the only application on the east coast that will be considered compliant with the One Stop Reporting (OSR) requirements. In addition, the majority of trips will be reported to the SAFIS system regardless of the tool selected.

Funds requested include both costs associated with initial deployment and ongoing support. Initial startup costs include, but are not limited to, in-person and virtual training workshops for harvesters and partner agency personnel and published training guides and videos that will be available via the ACCSP website. ACCSP continues to contract for help desk support for SAFIS which includes 24/7 helpdesk support, a toll free number to contact support personnel, and a helpdesk ticketing program designed to keep track of all requests and provide feedback to the Program. The ACCSP Director and ASMFC Executive Director have secured external funding to support the help desk and FISMA costs in FY2023.

Other Expenses	2023
Software Support	\$60,000
Hardware Support	\$7,500
Communications/Internet Connectivity	\$16,700
Printing (outreach)	\$2,500
Software Development	\$90,000
Help Desk Support	\$0
Total	\$176,700

Budget Summary

Budget Summary	2023
Personnel	\$1,321,846
Fringe Benefits	\$370,117
Travel	\$62,975
Equipment	\$27,500
Supplies	\$5,651
Other	\$176,700
Total Program	\$1,957,788
ASMFC Overhead (12.94%)	\$253,338
Total Proposal	\$2,206,609

Resources actively sought to support ACCSP activities in addition to the Administrative Grant

2023 Support	Coverage	Funding Expected
HMS	Partial Data Analyst	\$ 40,000
FIS Quality Management FY22 Proposal	Implementation of Automated Data Auditing Validation for Electronic Logbooks	\$ 116,810
FIS FIN Development FY22 Proposal	Federal Information Security Management Act Compliance	\$ 105,129
NOAA Fisheries Office of Science and Technology	ACCSP SAFIS Help Desk and FISMA Support	\$215,000
MRIP	State Conduct of MRIP APAIS, FHTS ME-GA, and additional surveys in some states (LPIS in ME, Catch Cards in MD & NC, and LPBS in NC). Includes Recreational Team Staff (4).	Total Grant: \$5,912,000 ACCSP: \$ 540,305

ATLANTIC STATES MARINE FISHERIES COMMISSION

Five-Year Strategic Plan 2019-2023



*The nation behaves well if it treats the natural resources
as assets which it must turn over to the next generation
increased and not impaired in value.*

Theodore Roosevelt

Introduction

Each state has a fundamental responsibility to safeguard the public trust with respect to its natural resources. Fishery managers are faced with many challenges in carrying out that responsibility. Living marine resources inhabit ecosystems that cross state and federal jurisdictions. Thus, no state, by itself, can effectively protect the interests of its citizens. Each state must work with its sister states and the federal government to conserve and manage natural resources.

Beginning in the late 1930s, the 15 Atlantic coastal states from Maine to Florida took steps to develop cooperative mechanisms to define and achieve their mutual interests in coastal fisheries. The most notable of these was their commitment to form the Atlantic States Marine Fisheries Commission (Commission) in 1942, and to work together through the Commission to promote the conservation and management of shared marine fishery resources. Over the years, the Commission has remained an effective forum for fishery managers to pursue concerted management actions. Through the Commission, states cooperate in a broad range of programs including interstate fisheries management, fisheries science, habitat conservation, and law enforcement.

Congress has long recognized the critical role of the states and the need to support their mutual efforts. Most notably, it enacted the Atlantic Coastal Fisheries Cooperative Management Act (Atlantic Coastal Act) in 1993, which built on the success of the Atlantic Striped Bass Conservation Act of 1984. Acknowledging that no single governmental entity has exclusive management authority for Atlantic coastal fishery resources, the Atlantic Coastal Act recognizes the states' responsibility for cooperative fisheries management through the Commission. The Atlantic Coastal Act charges all Atlantic states with implementing coastal fishery management plans that will safeguard the future of Atlantic coastal fisheries in the interest of both fishermen and the nation.

Accepting these challenges and maintaining their mutual commitment to success, the Atlantic coastal states have adopted this five-year Strategic Plan. The states recognize circumstances today make the work of the Commission more important than ever before. The Strategic Plan articulates the mission, vision, goals, and objectives needed to accomplish the Commission's mission. It serves as the basis for annual action planning, whereby Commissioners identify the highest priority issues and activities to be addressed in the upcoming year. With 27 species currently managed by the Commission, finite staff time, Commissioner time and funding, as well as a myriad of other factors impacting marine resources (e.g., changing ocean conditions, protected species interactions, offshore energy, and aquaculture), Commissioners recognize the absolute need to prioritize activities, dedicating staff time and resources where they are needed most and addressing less pressing issues as resources allow. Efforts will be made to streamline management by using multi-year specifications where possible and increase stability/predictability in fisheries management through less frequent regulatory changes. A

key to prioritizing issues and maximizing efficiencies will be working closely with the three East Coast Regional Management Councils and NOAA Fisheries.

Mission

The Commission's mission, as stated in its 1942 Compact, is:

To promote the better utilization of the fisheries, marine, shell and anadromous, of the Atlantic seaboard by the development of a joint program for the promotion and protection of such fisheries, and by the prevention of physical waste of the fisheries from any cause.

The mission grounds the Commission in history. It reminds every one of the Commission's sense of purpose that has been in place for over 77 years. The constantly changing physical, political, social, and economic environments led the Commission to restate the mission in more modern terms:

To promote cooperative management of marine, shell and diadromous fisheries of the Atlantic coast of the United States by the protection and enhancement of such fisheries, and by the avoidance of physical waste of the fisheries from any cause.

The mission and nature of the Commission as a mutual interstate body incorporate several guiding principles. They include:

- States are sovereign entities, each having its own laws and responsibilities for managing fishery resources within its jurisdiction
- States serve the broad public interest and represent the common good
- Multi-state resource management is complex and dependent upon cooperative efforts by all states involved
- The Commission provides a critical sounding board on issues requiring cross-jurisdictional action, coordinating cooperation, and collaboration among the states and federal government

Vision

The long-term vision of the Commission is:

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

Values

The Commission and its member states have adopted the following values to guide its operations and activities. These values affirm the Commission's commitment to sustainable

fisheries management for the benefit of recreational and commercial fishermen and coastal communities. They also acknowledge the growing importance of managing fisheries in a more holistic and adaptive way, seeking solutions to cross cutting resource issues that lead to long-term ecological and socio-economic sustainability.

- Effective stewardship of marine resources through strong partnerships
- Decisions based on sound science
- Long-term ecological sustainability
- Transparency and accountability in all actions
- Timely response to new information through adaptive management
- Balancing resource conservation with the economic success of coastal communities
- Efficient use of time and fiscal resources
- Work cooperatively with honesty, integrity, and fairness

Driving Forces

The Commission and its actions are influenced by a multitude of factors. These factors are constantly evolving and will most likely change over the time period of this Strategic Plan. However, the most pressing factors affecting the Commission today are changing ocean conditions, resource allocation, the quality and quantity of scientific information, competing ocean uses, a growing demand to address ecosystem functions, and interactions between fisheries and protected species. The Strategic Plan, through its goals and broad objectives, will seek to address each of these issues over the next five years.

Changing Ocean Conditions

Changes in ocean temperature, currents, acidification, and sea level rise are affecting nearly every facet of fisheries resources and management at the state, interstate, and federal levels. Potential impacts to marine species include prey and habitat availability, water quality, susceptibility to disease, and spawning and reproductive potential. The distribution and productivity of fishery stocks are often changing at a rate faster than fisheries stock assessments and management can keep pace with. Several Commission species, such as northern shrimp, Southern New England lobster, Atlantic cobia, black sea bass, and summer flounder are already responding to changes in the ocean. In the case of northern shrimp and Southern New England lobster, warming ocean waters have created inhospitable environments for species reproduction and survivability. For cobia, black sea bass, and summer flounder, changing ocean conditions have contributed to shifts in species distributions, with some species expanding their ranges and others moving into deeper and/or more northern waters to stay within preferred temperature ranges. Where shifts are occurring, the Commission may need to reconsider state-by-state allocation schemes and make adjustments to our fishery management plans. For other species depleted due to factors other than fishing mortality (e.g., habitat degradation and availability, predation), the states will need to explore steps that can be taken to aid in species recovery. And, if a stock's viability is compromised, Commission resources and

efforts should be shifted to other species that can be recovered or maintained as a rebuilt stock.

Allocation

As noted above, resource allocation among the states and between various user groups will continue to be an important issue over the next five years. Many of the Commission FMPs divvy up the available harvestable resource through various types of allocation schemes, such as by state, region, season, or gear type. The changing distribution of many species has further complicated the issue of resource allocation with traditional allocation schemes being challenged and a finite amount of fishery resources to be shared. Discussion may be difficult and divisive, with some states (and their stakeholders) wanting to maintain their historic (traditional) allocations, while others are seeking a greater share of the resource given increased abundance and availability in their waters. States will need to seek innovative ways to reallocate species so that collectively all states feel their needs are met. What will be required to successfully navigate these discussions and decisions is the commitment of the states to work through the issues with honesty, integrity, and fairness, seeking outcomes that balance the needs of the states and their stakeholders with the ever changing realities of shifting resource abundance and availability.

Science as the Foundation

Accurate and timely scientific information form the basis of the Commission's fisheries management decision-making. Continued investments in the collection and management of fishery-dependent and -independent data remain a high priority for the Commission and its member states. The challenge will be to maintain and expand data collection efforts in the face of shrinking state and federal budgets. Past and current investments by state, regional and federal partners of the Atlantic Coastal Cooperative Statistics Program (ACCSP) have established the program as the principal source of marine fishery statistics for the Atlantic coast. State and regional fishery-independent data collection programs, in combination with fishery statistics, provide the scientific foundation for stock assessments. Many data collection programs will continue to be strained by budget restrictions, scientists' workload capacities, and competing priorities. The Commission remains committed to pursuing long-term support for research surveys and monitoring programs that are critical to informing management decisions and resource sustainability.

Ecosystem Functions

Nationally, there has been a growing demand for fisheries managers to address broader ecosystem functions such as predator-prey interactions and environmental factors during their fisheries management planning. Ecosystem science has improved in recent years, though the challenges of comprehensive data collection continue. A majority of the Commission's species are managed and assessed on a single species basis. When ecosystem information is available, the Commission has managed accordingly to provide ecosystem services. The Commission remains committed to seeking ecological sustainability over the long-term through continuing its work on multispecies assessment modeling and the development of ecosystem-based reference points in its fisheries management planning process.

Competing Ocean Uses

Marine spatial planning has become an increasingly popular method of balancing the growing demands on valuable ocean resources. More specifically, the competing interests of commercial and recreational fishing, renewable energy development, aquaculture, marine transportation, offshore oil exploration and drilling, military needs, and habitat restoration are all components that must be integrated into successful ocean use policies. The Commission has always emphasized cooperative management with our federal partners; however, the states' authorities in their marine jurisdictions must be preserved and respected. The Commission will continue to prioritize the successful operation of its fisheries, but it will be imperative to work closely with federal, state, and local governments on emerging ocean use conflicts as they diversify into the future.

Protected Species

Like coastal fishery resources, protected species, such as marine mammals, sea turtles, and listed and candidate fish species, traverse both state and federal waters. The protections afforded these species under the Marine Mammal Protection Act and Endangered Species Act can play a significant role in the management and prosecution of Atlantic coastal fisheries. The Commission and the states have a long history of supporting our federal partners to minimize interactions with and bycatch of marine mammals and sea turtles. The listing of Atlantic sturgeon under the Endangered Species Act has added a whole new level of complexity in the ability of the Commission and its member states to carry out their stewardship responsibilities for these important diadromous species. The species spends the majority of its life in state waters and depend on estuarine and riverine habitat for their survival. Listing has the potential to jeopardize the states' ability to effectively monitor and assess stock condition, as well as impact fisheries that may encounter listed species. It is incumbent upon the Commission and its federal partners to work jointly to assess stock health, identify threats, and implement effective rebuilding programs for listed and candidate species.

More recently, the depleted status of the Northern right whale population and the potential impacts to this population by entanglement in fishing gear, particularly lobster and crab gear, has heightened concern for both whales and the lobster industry.

Increased Cooperation and Collaboration among the States and between the States and Our Federal Partners

Demands for ecosystem-based fisheries management, competing and often conflicting ocean uses, and legislative mandates to protect marine mammals and other protected species, further complicate fisheries management and require quality scientific information to help guide management decisions. There is a growing concern among fishery managers that some "control" over fisheries decisions and status has been diminished due to political intervention and our inability to effect changing ocean conditions and other environmental factors that impact marine resources. Fisheries management has never been more complex or politically charged. State members are pulled between what is best for their stakeholders versus what is best for the resource and the states as a whole.

While the issues may seem daunting, they are not insurmountable. In order for the Commission to be successful, the states must recommit to their collective vision of “Sustainable and Cooperative Management of Atlantic Coastal Fisheries,” recognizing that their strength lies in working together to address the fisheries issues that lie ahead. Given today’s political and environmental realities, the need for cooperation among the states has never been more important. It is also critical the states and their federal partners seek to strengthen their cooperation and working relationships, providing for efficient and effective fisheries management across all agencies. No one state or federal agency has the resources, authority, or ability to do it alone.

GOALS & OBJECTIVES

The Commission will pursue the following eight goals and their related strategies during the five-year planning period, from 2019 through 2023. It will pursue these goals through specific objectives, targets, and milestones outlined in an annual Action Plan, which is adopted each year at the Commission’s Annual Meeting to guide the subsequent year’s activities. Throughout the year, the Commission and its staff will monitor progress in meeting the Commission’s goals, and evaluate the effectiveness of the strategies. While committed to the objectives included in this plan, the Commission is ready to adopt additional objectives to take advantage of new opportunities and address emerging issues as they arise.

Goal 1 - Rebuild, maintain, fairly allocate, and promote sustainable Atlantic coastal fisheries

Goal 1 focuses on the responsibility of the states to conserve and manage Atlantic coastal fishery resources for sustainable use. Commission members will advocate decisions to achieve the long-term benefits of conservation, while balancing the socio-economic interests and needs of coastal communities. Inherent in this is the recognition that healthy and vibrant resources benefit stakeholders. The states are committed to proactive management, with a focus on integrating ecosystem services, socio-economic impacts, habitat issues, bycatch and discard reduction measures, and protected species interactions into well-defined fishery management plans. Fishery management plans will also address fair allocation of fishery resources among the states. Understanding changing ocean conditions and their impact on fishery productivity and distribution is an elevated priority. Successful management under changing ocean conditions will depend not only on adjusting management strategies, but also in reevaluating and revising, as necessary, the underlying conservation goals and objectives of fishery management plans. Improving cooperation and coordination with federal partners and stakeholders can streamline efficiency, transparency, and, ultimately, success. In the next five years, the Commission is committed to ending overfishing and working to rebuild overfished Atlantic coast fish stocks, while promoting sustainable harvest of and access to rebuilt fisheries. Where possible, the Commission will seek to aid in the rebuilding of depleted stocks, whose recovery is hindered by factors other than fishing pressure.

Annual action planning will be guided by the following objectives:

- Manage interstate resources that provide for productive, sustainable fisheries using sound science
- Strengthen state and federal partnerships to improve comprehensive management of shared fishery resources
- Adapt management to address emerging issues
- Practice efficient, transparent, and accountable management processes
- Evaluate progress towards rebuilding fisheries
- Promote sustainable harvest of and access to rebuilt fisheries
- Strengthen interactions and input among stakeholders, technical, advisory, and management groups

Goal 2 – Provide sound, actionable science to support informed management actions

Sustainable management of fisheries relies on accurate and timely scientific advice. The Commission strives to produce sound, actionable science through a technically rigorous, independently peer-reviewed stock assessment process. Assessments are developed using a broad suite of fishery-independent surveys and fishery-dependent monitoring, as well as research products developed by a broad network of fisheries scientists at state, federal, and academic institutions along the coast. The goal encompasses the development of new, innovative scientific research and methodology, and the enhancement of the states' stock assessment capabilities. It provides for the administration, coordination, and expansion of collaborative research and data collection programs. Achieving the goal will ensure sound science is available to serve as the foundation for the Commission's evaluation of stock status and adaptive management actions.

Annual action planning will be guided by the following objectives:

- Conduct stock assessments based on comprehensive data sources and rigorous technical analysis;
- Characterize the risk and uncertainty associated with the scientific advice provided to decision-makers
- Provide training to enhance the expertise and involvement of state and staff scientists in the development of stock assessments
- Streamline data assimilation within individual states, and among states and ASMFC
- Proactively address research priorities through cooperative state and regional data collection programs and collaborative research projects, including stakeholder involvement
- Explore the use of new technologies to improve surveys, monitoring, and the timeliness of scientific products
- Promote effective communication with stakeholders to ensure on-the-water observations and science are consistent

- Utilize ecosystem and climate science products to inform fisheries management decisions

Goal 3 - Produce dependable and timely marine fishery statistics for Atlantic coast fisheries

Effective management depends on quality fishery-dependent data and fishery-independent data to inform stock assessments and fisheries management decisions. While Goal 2 of this Action Plan focuses on providing sound, actionable science and fishery-independent data to support fisheries management, Goal 3 focuses on providing timely, accurate catch and effort data on Atlantic coast recreational, for-hire, and commercial fisheries.

Goal 3 seeks to accomplish this through the activities of the Atlantic Coastal Cooperative Statistics Program (ACCSP), a cooperative state-federal program that designs, implements, and conducts marine fisheries statistics data collection programs and integrates those data into data management systems that will meet the needs of fishery managers, scientists, and fishermen. ACCSP partners include the 15 Atlantic coast state fishery agencies, the three Atlantic Fishery Management Councils, the Potomac River Fisheries Commission, NOAA Fisheries, and the U.S. Fish and Wildlife Service.

Annual action planning will be guided by the following objectives:

- Focus on activities that maximize benefits, are responsive and accountable to partner and end-user needs, and are based on available resources.
- Cooperatively develop, implement, and maintain coastwide data standards through cooperation with all program partners
- Provide electronic applications that improve partner data collection
- Integrate and provide access to partner data via a coastwide repository
- Facilitate fisheries data access through an on-line, user-friendly, system while protecting confidentiality
- Support technological innovation

Goal 4 – Protect and enhance fish habitat and ecosystem health through partnerships and education

Goal 4 aims to conserve and improve coastal, marine, and riverine habitat to enhance the benefits of sustainable Atlantic coastal fisheries and resilient coastal communities in the face of changing ecosystems. Habitat loss and degradation have been identified as significant factors affecting the long-term sustainability and productivity of our nation's fisheries. The Commission's Habitat Program develops objectives, sets priorities, and produces tools to guide fisheries habitat conservation efforts directed towards ecosystem-based management.

The challenge for the Commission and its state members is maintaining fish habitat under limited regulatory authority for habitat protection or enhancement. Therefore, the Commission will work cooperatively with state, federal, and stakeholder partnerships to achieve this goal. Much of the work to address habitat is conducted through the Commission's Habitat and Artificial Reef Committees. In order to identify fish habitats of concern for Commission managed species, each year the Habitat Committee reviews existing reference documents for Commission-managed species to identify gaps or updates needed to describe important habitat types and review and revise species habitat factsheets. The Habitat Committee also publishes an annual issue of the *Habitat Hotline Atlantic*, highlighting topical issues that affect all the states.

The Commission and its Habitat Program endorses the National Fish Habitat Partnership, and will continue to work cooperatively with the partnership to improve aquatic habitat along the Atlantic coast. Since 2008, the Commission has invested considerable resources, as both a partner and administrative home, to the Atlantic Coastal Fish Habitat Partnership (ACFHP), a coastwide collaborative effort to accelerate the conservation and restoration of habitat for native Atlantic coastal, estuarine-dependent, and diadromous fishes. As part of this goal, the Commission will continue to provide support for ACFHP, under the direction of the National Fish Habitat Partnership Board.

Annual action planning will be guided by the following objectives:

- Identify fish habitats of concerns through fisheries management programs and partnerships
- Educate Commissioners, stakeholders, and the general public about the importance of habitat to healthy fisheries and ecosystems
- Better integrate habitat information and data into fishery management plans and stock assessments
- Engage local state, and regional governments in mutually beneficial habitat protection and enhancement programs
- Foster partnerships with management agencies, researchers, and habitat stakeholders to leverage scientific, regulatory, political, and financial support
- Work with ACFHP to foster partnerships with like-minded organizations at local levels to further common habitat goals

Goal 5 – Promote compliance with fishery management plans to ensure sustainable use of Atlantic coast fisheries

Fisheries managers, law enforcement personnel, and stakeholders have a shared responsibility to promote compliance with fisheries management measures. Activities under the goal seek to increase and improve compliance with fishery management plans. This requires the successful coordination of both management and enforcement activities among state and federal agencies. Commission members recognize that adequate and consistent enforcement of fisheries rules is required to keep pace with increasingly complex

management activity and emerging technologies. Achieving the goal will improve the effectiveness of the Commission's fishery management plans.

Annual action planning will be guided by the following objectives:

- Develop practical compliance requirements that foster stakeholder buy-in
- Evaluate the enforceability of management measures and the effectiveness of law enforcement programs
- Promote coordination and expand existing partnerships with state and federal natural resource law enforcement agencies
- Enhance stakeholder awareness of management measures through education and outreach
- Use emerging communication platforms to deliver real time information regarding regulations and the outcomes of law enforcement investigations

Goal 6 – Strengthen stakeholder and public support for the Commission

Stakeholder and public acceptance of Commission decisions are critical to our ultimate success. For the Commission to be effective, these groups must have a clear understanding of our mission, vision, and decision-making processes. The goal seeks to do so through expanded outreach and education efforts about Commission programs, decision-making processes, and its management successes and challenges. It aims to engage stakeholders in the process of fisheries management, and promote the activities and accomplishments of the Commission. Achieving the goal will increase stakeholder participation, understanding, and acceptance of Commission activities.

Annual action planning will be guided by the following objectives:

- Increase public understanding and support of activities through expanded outreach at the local, state, and federal levels
- Clearly define Commission processes to facilitate stakeholder participation, as well as transparency and accountability
- Strengthen national, regional, and local media relations to increase coverage of Commission actions
- Use new technologies and communication platforms to more fully engage the broader public in the Commission's activities and actions

Goal 7 – Advance Commission and member states' priorities through a proactive legislative policy agenda

Although states are positioned to achieve many of the national goals for marine fisheries through cooperative efforts, state fisheries interests are often underrepresented at the national level. This is due, in part, to the fact that policy formulation is often disconnected from the processes that provide the support, organization, and resources necessary to implement the policies. The capabilities and input of the states are an important aspect of

developing national fisheries policy, and the goal seeks to increase the states' role in national policy formulation. Additionally, the goal emphasizes the importance of achieving management goals consistent with productive commercial and recreational fisheries and healthy ecosystems.

The Commission recognizes the need to work with Congress in all phases of policy formulation. Several important fishery-related laws will be reauthorized over the next couple of years (i.e., Atlantic Coastal Act, Magnuson-Stevens Fishery Conservation and Management Act, Interjurisdictional Fisheries Act, Atlantic Striped Bass Conservation Act, and Anadromous Fish Conservation Act). The Commission will be vigilant in advancing the states' interests to Congress as these laws are reauthorized and other fishery-related pieces of legislation are considered.

Annual action planning will be guided by the following objectives:

- Increase the Commission's profile and support in the U.S. Congress by developing relationships between Members and their staff and Commissioners, the Executive Director, and Commission staff
- Maintain or increase long term funding for Commission programs through the federal appropriations process and other available sources.
- Engage Congress on fishery-related legislation affecting the Atlantic coast
- Promote member states' collective interests at the regional and national levels
- Promote economic benefits of the Commission's actions (return on investment)

Goal 8 – Ensure the fiscal stability & efficient administration of the Commission

Goal 8 will ensure that the business affairs of the Commission are managed effectively and efficiently, including workload balancing through the development of annual action plans to support the Commission's management process. It also highlights the need for the Commission to efficiently manage its resources. The goal promotes the efficient use of legal advice to proactively review policies and react to litigation as necessary. It also promotes human resource policies that attract talented and committed individuals to conduct the work of the Commission. The goal highlights the need for the Commission as an organization to continually expand its skill set through training and educational opportunities. It calls for Commissioners and Commission staff to maintain and increase the institutional knowledge of the Commission through periods of transition. Achieving this goal will build core strengths, enabling the Commission to respond to increasingly difficult and complex fisheries management issues.

Annual action planning will be guided by the following objectives:

- Conservatively manage the Commission's operations and budgets to ensure fiscal stability
- Utilize new information technology to improve meeting and workload efficiencies, and enhance communications

- Refine strategies to recruit professional staff, and enhance growth and learning opportunities for Commission and state personnel
- Fully engage new Commissioners in the Commission process and document institutional knowledge.
- Utilize legal advice on new management strategies and policies, and respond to litigation as necessary.



Atlantic Coastal Cooperative Statistics Program

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This list includes dates for fiscal year 2022, including ACCSP committee meetings, relevant dates of the funding cycle, as well as meetings or conferences ACCSP typically attends or which may be of interest to our partners. If you have any questions or comments on this calendar please do not hesitate to contact the ACCSP staff at info@accsp.org.

Feb 1-3:	NEFMC Meeting – Portsmouth, NH
Feb 7:	Recreational Technical Committee – Webinar
Feb 8-10:	MAFMC Meeting – Durham, NC
Feb 9:	Biological Review Panel Annual Meeting – Webinar
Feb 9:	Bycatch Prioritization Committee Annual Meeting – Webinar
Feb 22:	Atlantic Coast FHTS Training– Webinar
Feb 23-24:	Atlantic Coast APAIS Training– Webinar
Mar 1:	Start of ACCSP FY22
Mar 2:	Information Systems Committee Annual Meeting – Webinar
Mar 3:	Commercial Technical Committee Annual Meeting – Webinar
Mar 7-11:	SAFMC Meeting – Jekyll Island, GA
Apr 5-7:	MAFMC Meeting – Galloway, NJ
Apr 12-14:	NEFMC Meeting – Mystic, CT
Week of April 11:	Operations and Advisory Committees Spring Meeting – Webinar
Week of April 11:	Recreational Technical Committee – Webinar
May 2-5:	ASMFC/Coordinating Council Meeting – Arlington, VA
May 11:	ACCSP issues request for proposals
Late May:	APAIS Wave 2 Meeting – Webinar
Jun 7-9:	MAFMC Meeting – Riverhead, NY
Jun 13-17:	SAFMC Meeting – Key West, FL
Jun 15:	Initial proposals are due
Jun 22:	Initial proposals are distributed to Operations and Advisory Committees
Jun 28-30:	NEFMC Meeting – Portland, ME
July 6:	Any initial written comments on proposals due
Week of Jul 11:	Review of initial proposals by Operations and Advisory Committees – Webinar
July 20:	If applicable, any revised written comments due
Week of Jul 25:	Feedback submitted to principal investigators
Late July:	APAIS Wave 3 Meeting – Webinar
Aug 1-4:	ASMFC Meeting/Coordinating Council Meeting – Arlington, VA

Aug 8-11:	MAFMC Meeting – Philadelphia, PA
Aug 17:	Revised proposals due
Aug 24:	Revised proposals distributed to Operations and Advisory Committees
Week of Sep 5: Webinar	Preliminary ranking exercise for Advisors and Operations Members –
Sep 12-16:	SAFMC Meeting – Charleston, SC
Sep 20-21:	Annual Advisors/Operations Committee Joint Meeting (in-person; location TBD)
Sep 27-29:	NEFMC Meeting – Gloucester, MA
Late October:	APAIS Wave 4 Meeting – Webinar
Oct 4-6:	MAFMC Meeting – Dewey Beach, DE
Oct 19-21:	ASMFC Annual Meeting/Coordinating Council Meeting – Webinar
Dec 5-9:	SAFMC Meeting – Wrightsville Beach, NC
Dec 6-8:	NEFMC Meeting – Newport, RI
Dec 12-15:	MAFMC Meeting – Annapolis, MD

Geoff White

ACCSP Director



EXECUTIVE COMPETENCIES

- Committed to excellence and accountability
- Empowering leadership and inclusive management style
- Leveraging technology and cooperative approach
- Belief in holistic and integrated solutions
- Passion for strategic vision
- Project design and oversight
- Financial responsibility and accountability
- Effective communicator, writer and presenter
- Proven ACCSP ambassador

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SELECTED ACHIEVEMENTS

- Supported reduced fishery reporting burden through One Stop Reporting.
- Improved efficiency of APAIS data collection by integrating tablet data capture, Oracle database, SAS processing and delivery.
- Extended state conduct of MRIP FHTS and LPS with integrated web tools.
- Developed budget and managed over \$4.5M annual funding for multiple MRIP surveys through ACCSP and 13 State Partners
- Initiated development of comprehensive for-hire data collection methods.
- Developed and implemented the MRIP APAIS Atlantic state conduct transition
- Conceived and implemented changes to improve availability of ACCSP data

EMPLOYMENT EXPERIENCE

Director, ACCSP 2019 – Present

Responsible for ACCSP strategic direction through the Coordinating Council, and management of ongoing projects. Represent ASMFC and Atlantic states on data related topics in regional and national meetings.

Recreational Program Manager ACCSP 2015 – 2019

Responsible for ACCSP's recreational fishery data standards and implementing state conduct of MRIP APAIS and FHTS surveys. Developed coastwide budgets, data collection, processing, and delivery systems. Managed local staff and guided partner staff in survey completion. Represented ACCSP and Atlantic states on MRIP Regional Council and at national meetings.

Data Team Lead / Systems Admin ACCSP 2008 – 2015

Provided data team leadership and subject expertise for ACCSP data projects and priorities. Engineered transition to state conduct of MRIP APAIS. Responsible for ACCSP information systems maintenance including network, servers, oracle databases, and 2010 office relocation.

Systems Admin -ACCSP 2004-2008

Responsible for the ACCSP's IT infrastructure. Provided subject expertise for partner data access, data translations, and development of web-based recreational and commercial queries.

Fisheries Specialist -ASMFC 1998-2004

Coordinated SEAMAP SA, staffed development of two multi-species assessment models, designed and implemented the Lobster Assessment Database, coordinated fisheries research programs and stock assessment reviews supporting fisheries management.

Marine Scientist -VIMS 1996-1998

Estimated fishing mortality of tautog in Virginia waters. Project results accepted as Virginia's fishery status in the ASMFC Tautog FMP.

MANAGEMENT EXPERIENCE

- Managed multiple concurrent projects and contracts to extend ACCSP capabilities.
- Contributing member of MRIP Regional Implementation Council & MRIP NAS reviews.
- Extended development of the MRIP survey state conduct through leadership of three local staff and 160 remote partner staff.
- Coached RecTech Committee development of Atlantic Recreational Implementation Plan.
- Supported Cooperative agreement funding and management, including proposal writing, information gathering, contract oversight, and report submission.
- Demonstrated ability to bring together diverse groups on issues by coordinating and facilitating workshops.

FISHERIES EXPERIENCE

- Deep understanding of the ACCSP mission, activities, and partners gained over 24 years of working in consensus-driven environment of Atlantic coast fisheries management
- Adept at balancing state and federal partner needs in the development of coastwide data standards, data entry and query tools for recreational and commercial fisheries data
- Proven ability to understand fisheries stock assessment data needs

IT EXPERIENCE

Software Development – Strategic priorities for SAFIS capabilities. Managed and programmed projects to create Data Warehouse end user queries, APAIS web interface, APAIS Tablet application, API data transmission and FHTS CATI.

Oracle DBA – Managed 10 DB instances supporting coastwide standardization of fisheries data collection and dissemination.

Systems Administrator– Performed or directed data center implementation and support including network security & system availability.

EDUCATION & AWARDS

- B.S. Dickinson College
- M.S. Virginia Institute of Marine Science
- ASMFC Stock Assessment Training I-III
- Oracle PL/SQL, DB Administration, Windows & Linux Server Administration
- Project Management & Leadership Training
- ASMFC Employee of the Qtr 2003, 2011
- ASMFC Directors Meritorious Service 2017
- ASMFC Science & Technical Excellence 2019
- Eagle Scout, Boy Scouts of America

Funding Decision Process
Atlantic Coastal Cooperative Statistics Program
May 2022

The Atlantic Coastal Cooperative Statistics Program (the Program) is a state-federal cooperative initiative to improve recreational and commercial fisheries data collection and data management activities on the Atlantic coast. The program supports further innovation in fisheries-dependent data collection and management technology through its annual funding process.

Each year, ACCSP issues a Request for Proposals (RFP) to its Program Partners. The ACCSP Operations and Advisory Committees review submitted project proposals and make funding recommendations to the Deputy Director and the Coordinating Council.

This document provides an overview of the funding decision process, guidance for preparing and submitting proposals, and information on funding recipients' post-award responsibilities, including providing reports on project progress.

Overview of the Funding Decision Process

- [Funding Decision Process Timeline](#)
- [Detailed Steps](#)

Funding Decision Process Timeline

April- Operations and Advisory Committees develop annual funding priorities, criteria and allocation targets (maintenance vs. new projects)

May- Coordinating Council issues Request for Proposals (RFP)

June- Partners submit proposals

July- Operations and Advisory Committees review initial proposals, PIs are invited (not mandatory) to this meeting to answer questions and hear feedback; ACCSP staff provide initial review results to submitting Partner

August- Final proposals are submitted. Final proposals must be submitted electronically to the Deputy Director, and/or designee by close of business on the day of the specified deadline. Final proposals received after the RFP deadline will not be considered for funding.

September- Operations and Advisory Committees review and rank final proposals

October- Funding recommendations presented to Coordinating Council; Coordinating Council makes final funding decision

ACCSP Staff submits notification to submitting Partner of funded projects and notification of approved projects to appropriate grant funding agency (e.g. NOAA Fisheries Regional Grants Program Office, “NOAA Grants”) by Partner

As Needed- Operation and/or Leadership Team and Coordinating Council review and make final decision with contingencies (e.g. scope of work, rescissions, no-cost extensions, returned unused funds, etc.)

Detailed Steps of Funding Decision Process

1. Develop Annual Funding Priorities, Criteria and Allocation Targets (maintenance vs. new projects).

Prior to issuing the Request for Proposals, the Coordinating Council will approve the annual funding criteria and allocation targets. These will be used to rank projects and allocate funding between maintenance and new projects respectively.

In FY16, a long-term funding strategy policy was instituted to limit the duration of maintenance projects. Maintenance projects are now subject to a funding reduction following their fourth year of maintenance funding.

- For maintenance projects entering year 5 of ACCSP funding in FY20, a 33 percent funding cut was applied to whichever sum was larger: the project’s prior two-year-average base funding set in FY16, or the average annual sum received during the project’s four years of full *maintenance* funding. In year 6, a further 33 percent cut will be applied and funding will cease in year 7. Please see Appendix A for a list of maintenance projects entering year 6 in FY20 and the maximum funds available for these projects.
- For more recent maintenance projects (i.e., those entering year 5 of maintenance funding after FY20), the base funding will be calculated as the average of funding received during the project’s four years as a *maintenance* project. These projects will receive a 33 percent cut in year 5, a further 33 percent cut in year 6, and funding will cease in year 7. Please see Appendix A for a list of maintenance projects entering year 5 or 6 in FY23 and the maximum funds available for these projects.

2. Issue Request for Proposals

An RFP will be sent to all Program Partners and Committees no later than the week after the spring Coordinating Council meeting. The RFP will include the ranking criteria, allocation targets approved by the Coordinating Council, and general Program priorities taken from Goal 3 of the current ASMFC Five-Year Strategic Plan. The RFP and related documents will also be posted on the Program’s website [here](#).

All proposals MUST be submitted either by a Program Partner, jointly by several Program Partners, or through a Program Committee. The public has the ability to work with a Program Partner to develop and submit a proposal. Principle investigators are strongly encouraged to work with their Operations Committee member in the development of any proposal. All proposals must be submitted electronically to the Deputy Director, and/or designee, in the standard format.

3. Review initial proposals

Proposals will be reviewed by staff and the Operations and Advisory Committees. Committee members are encouraged to coordinate with their offices and/or constituents to provide input to the review process. Operations Committee members are also encouraged to work with staff in their offices who have submitted a proposal in order to represent the proposal during the review. Project PIs will be invited to attend the initial proposal review, held in July. The review and evaluation of all written proposals will take into consideration the ranking criteria, funding allocation targets and the overall Program Priorities as specified in the RFP. Proposals may be forwarded to relevant Program technical committees for further review of the technical feasibility and statistical validity. Proposals that fail to meet the ACCSP standards may be recommended for changes or rejected.

4. Provide initial review results to submitting Partner

Program staff will notify the submitting Partner of suggested changes, requested responses, or questions arising from the review. The submitting Partner will be given an opportunity to submit a final proposal incorporating suggested changes in the same format previously described in Step 2(b) by the final RFP deadline.

5. Review and rank final proposals

The review and ranking of all proposals will take into consideration the ranking criteria, funding allocation targets, and overall Program Priorities as specified in the RFP. The Deputy Director and the Advisory and Operations Committees will develop a list of prioritized recommended proposals and forward them for discussion, review, and approval by the Coordinating Council.

6. Proposal approval by the Coordinating Council

The Coordinating Council will review a summary of all submitted proposals and prioritized recommended proposals from the Operations and Advisory Committees. Each representative on the Coordinating Council will have one vote during final prioritization of project proposals. Projects to be funded by the Program will be approved by the Coordinating Council by the end of November each year. The Deputy Director will submit a pre-notification to the appropriate NOAA Grants office of the prioritized proposals to expedite processing when those offices receive Partner grant submissions.

7. Confirmation of final funding amounts

The Director and Deputy Director will be notified by NOAA Fisheries of any federal grant adjustments (e.g. additions or rescissions). Additional funds will generally go to the next available ranked project. Reductions may include, but are not limited to:

- Lower than anticipated amounts from any source of funding
- Rescission of funding after initial allocations have been made
- Partial or complete withdrawal of funds from any source

If these or other situations arise, the Operations Committee will notify Partners with approved proposals to reduce their requested budgets or to withdraw a proposal entirely. If this does not reduce the overall requested amount sufficiently, the Director, Deputy Director, the Operations Committee Chair and Vice-Chair, and the Advisory Committee Chair will develop a final recommendation and forward to the ACCSP Leadership Team of the Coordinating Council. These options to address funding contingencies may include:

- Eliminating the lowest-ranked proposal(s)
- A fixed percentage cut to all proposals' budgets
- A directed reduction in a specific proposal(s)

8. Notification to submitting Partner of funded projects and submittal of project documents to appropriate grants agency (e.g. NOAA Grants) by Partner.

Notification detailing the Coordinating Council's actions relevant to a Partner's proposal will be sent to each Partner by Program staff.

- Approved projects from Non-federal Partners must be submitted as full applications (federal forms, project and budget narratives, and other attachments) to NOAA Grants via www.grants.gov. These documents must reflect changes or conditions approved by the Coordinating Council.
- Non-federal Partners must provide the Deputy Director with an electronic copy of the narrative and either an electronic or hard copy of the budget of the grant application as submitted to the grants agency (e.g. NOAA Grants).
- Federal Partners do not submit applications to NOAA Grants.

9. Operation and/or Leadership Team and Coordinating Council review and final decision with contingencies or emergencies.

Committee(s) review and decide project changes (e.g. scope of work, rescissions, no-cost extensions, returned unused funds, etc.) during the award period.

Proposal Guidance

- [General Proposal Guidelines](#)
- [Format](#)
- [Budget Template](#)

General Proposal Guidelines

- The Program is predicated upon the most efficient use of available funds. Many jurisdictions have data collection and data management programs which are administered by other fishery management agencies. Detail coordination efforts your agency/Committee has undertaken to demonstrate cost-efficiency and non-duplication of effort.
- All Program Partners conducting projects for implementation of the program standards in their jurisdictions are required to submit data to the Program in prescribed standards, where the module is developed and formats are available. Detail coordination efforts with Program data management staff with projects of a research and/or pilot study nature to submit project information and data for distribution to all Program Partners and archives.
- If appropriate to your project, please detail your agency's data management capability. Include the level of staff support (if any) required to accomplish the proposed work. If contractor services are required, detail the level and costs.
- Before funding will be considered beyond year one of a project, the Partner agency shall detail in writing how the Partner agency plans to assume partial or complete funding or, if not feasible, explain why.
- If appropriate to your project, detail any planned or ongoing outreach initiatives. Provide scope and level of outreach coordinated with either the Program Assistant and/or Deputy Director.
- Proposals including a collection of aging or other biological samples must clarify Partner processing capabilities (i.e., how processed and by whom).
- Provide details on how the proposal will benefit the Program as a whole, outside of benefits to the Partner or Committee.
- Proposals that request funds for law enforcement should confirm that all funds will be allocated towards reporting compliance.
- Proposals must detail any in-kind effort/resources, and if no in-kind resources are included, state why.

- Proposals must meet the same quality as would be appropriate for a grant proposal for ACFCMA or other federal grant.
- Assistance is available from Program staff, or an Operations Committee member for proposal preparation and to insure that Program standards are addressed in the body of a given proposal.
- Even though a large portion of available resources may be allocated to one or more jurisdictions, new systems (including prototypes) will be selected to serve all Partners' needs.
- Partners submitting pilot or other short-term programs are encouraged to lease large capital budget items (vehicles, etc.) and where possible, hire consultants or contractors rather than hire new permanent personnel.
- The Program will not fund proposals that do not meet Program standards. However, in the absence of approved standards, pilot studies may be funded.
- Proposals will be considered for modules that may be fully developed but have not been through the formal approval process. Pilot proposals will be considered in those cases.
- The Operations Committee may contact Partners concerning discrepancies or inconsistencies in any proposal and may recommend modifications to proposals subject to acceptance by the submitting Partner and approval by the Coordinating Council. The Operations Committee may recommend changes or conditions to proposals. The Coordinating Council may conditionally approve proposals. These contingencies will be documented and forwarded to the submitting Partner in writing by Program staff.
- Any proposal submitted after the initial RFP deadline will not be considered, in addition to any proposal submitted by a Partner which is not current with all reporting obligations.

Proposal Format

Applicant Name: Identify the name of the applicant organization(s).

Project Title: A brief statement to identify the project.

Project Type: Identify whether new or maintenance project.

New Project – Partner project never funded by the Program. New projects may not exceed a duration of one year.

Maintenance Project – Project funded by the Program that conducts the same scope of work as a previously funded new or maintenance project. These proposals may not contain significant changes in scope (e.g., the addition of bycatch data collection to a catch/effort dealer reporting project). Pls must include in the cover letter whether there are any changes in the current proposal from prior years' and, if so, provide a brief summary of those changes. At year 5 of maintenance funding, a project's base funding will be calculated as the average of funding received during the project's four years as a maintenance project.

Requested Award Amount: Provide the total requested amount of proposal. Do not include an estimate of the NOAA grant administration fee.

Requested Award Period: Provide the total time period of the proposed project. The award period typically will be limited to one-year projects.

Objective: Specify succinctly the “why”, “what”, and “when” of the project.

Need: Specify the need for the project and the association to the Program.

Results and Benefits: Identify and document the results or benefits to be expected from the proposed project. Clearly indicate how the proposed work meets various elements outlined in the ACCSP Proposal Ranking Criteria Document (Appendix B). Some potential benefits may include: fundamental in nature to all fisheries; region-wide in scope; answering or addressing region-wide questions or policy issues; required by MSFCMA, ACFCMA, MMPA, ESA, or other acts; transferability; and/or demonstrate a practical application to the Program.

Data Delivery Plan: Include coordinated method of the data delivery plan to the Program in addition to module data elements gathered. The data delivery plan should include the frequency of data delivery (i.e. monthly, semi-annual, annual) and any coordinate delivery to other relevant partners.

Approach: List all procedures necessary to attain each project objective. If a project includes work in more than one module, identify approximately what proportion of effort is comprised within each module (e.g., catch and effort 45%, biological 30% and bycatch 25%). Please note that only one primary module and one secondary module are considered for ranking.

Geographic Location: The location where the project will be administered and where the scope of the project will be conducted.

Milestone Schedule: An activity schedule in table format for the duration of the project, starting with Month 1 and ending with a three-month report writing period.

Project Accomplishments Measurement: A table showing the project goals and how progress towards those goals will be measured. In some situations the metrics will be numerical such as numbers of anglers contacted, fish measured, and/or otoliths collected, etc.; while in other cases the metrics will be binary such as software tested and software completed. Additional details such as intermediate metrics to achieve overall proposed goals should be included especially if the project seeks additional years of funding.

Cost Summary (Budget): Detail all costs to be incurred in this project in the format outlined in the budget guidance and template at the end of this document. A budget narrative should be included which explains and justifies the expenditures in each category. Provide cost projections for federal and total costs. Provide details on Partner/in-kind contribution (e.g., staff time, facilities, IT support, overhead, etc.). Details should be provided on start-up versus long-term operational costs.

In-kind - ¹Defined as activities that could exist (or could happen) without the grant. ²In-kind contributions are from the grantee organization. In-kind is typically in the form of the value of personnel, equipment and services, including direct and indirect costs.

¹The following are generally accepted as in-kind contributions:

- i. Personnel time given to the project including state and federal employees
- ii. Use of existing state and federal equipment (e.g. data collection and server platforms, Aging equipment, microscopes, boats, vehicles)

Overhead rates may not exceed 25% of total costs unless mandated by law or policy. Program Partners may not be able to control overhead/indirect amounts charged. However, where there is flexibility, the lowest amount of overhead should be charged. When this is accomplished indicate on the 'cost summary' sheet the difference between the overhead that could have been charged and the actual amount charged, if different. If overhead is charged to the Program, it cannot also be listed as in-kind.

Maintenance Projects: Maintenance proposals must provide project history table, description of completed data delivery to the ACCSP and other relevant partners, table of total project cost by year, a summary table of metrics and achieved goals, and the budget narrative from the most recent year's funded proposal.

Principal Investigator: List the principal investigator(s) and attach curriculum vitae (CV) for each. Limit each CV to two pages. Additional information may be requested.

Budget Guidelines & Template

All applications must have a detailed budget narrative explaining and justifying the expenditures by object class. Include in the discussion the requested dollar amounts and how they were derived. A spreadsheet or table detailing expenditures is useful to clarify the costs (see template below). The following are highlights from the NOAA Budget Guidelines document to help Partners formulate their budget narrative. The full Budget Guidelines document is available [here](#).

Object Classes:

Personnel: include salary, wage, and hours committed to project for each person by job title. Identify each individual by name and position, if possible.

Fringe Benefits: should be identified for each individual. Describe in detail if the rate is greater than 35 % of the associated salary.

Travel: all travel costs must be listed here. Provide a detailed breakdown of travel costs for trips over \$5,000 or 5 % of the award. Include destination, duration, type of transportation, estimated cost, number of travelers, lodging, mileage rate and estimated number of miles, and per diem.

Equipment: equipment is any single piece of non-expendable, tangible personal property that costs \$5,000 or more per unit and has a useful life of more than one year. List each piece of equipment, the unit cost, number of units, and its purpose. Include a lease vs. purchase cost analysis. If there are no lease options available, then state that.

Supplies: purchases less than \$5,000 per item are considered by the federal government as supplies. Include a detailed, itemized explanation for total supplies costs over \$5,000 or 5% of the award.

Contractual: list each contract or subgrant as a separate item. Provide a detailed cost breakdown and describe products/services to be provided by the contractor. Include a sole source justification, if applicable.

Other: list items, cost, and justification for each expense.

Total direct charges

Indirect charges: If claiming indirect costs, please submit a copy of the current approved negotiated indirect cost agreement. If expired and/or under review, a copy of the transmittal letter that accompanied the indirect cost agreement application is requested.

Totals of direct and indirect charges

Example. Budget narrative should provide further detail on these costs.

Description	Calculation	Cost
Personnel (a)		
Supervisor	Ex: 500 hrs x \$20/hr	\$10,000
Biologist		
Technician		
Fringe (b)		
Supervisor	Ex: 15% of salary	\$1500
Biologist		
Technician		
Travel (c)		
Mileage for sampling trips	Ex: Estimate 2000 miles x \$0.33/mile	\$660
Travel for meeting		
Equipment (d)		
Boat	Ex: \$7000, based on current market research	\$7000
Supplies (e)		
Safety supplies		\$1200
Sampling supplies		\$1000
Laptop computers	2 laptops @\$1500 each	\$3000
Software		\$500
Contractual (f)		
Data Entry Contract	Ex: 1000 hrs x \$20/hr	\$20,000
Other (h)		
Printing and binding		
Postage		
Telecommunications charges		
Internet Access charges		
Totals		
Total Direct Charges (i)		
Indirect Charges (j)		
Total (sum of Direct and Indirect) (k)		

Post-award Responsibilities

- [Changing the Scope of Work](#)
- [Requesting a No-cost Extension](#)
- [Declaring Unused/Returned Funds](#)
- [Reporting Requirements](#)
- [Report Format](#)
- [Programmatic Review](#)

Changing the Scope of Work

Partners shall submit requests for amendments to approved projects in writing to the Deputy Director. The Coordinating Council member for that Partner must sign the request.

When Partners request an amendment to an approved project, the Deputy Director will contact the Chair and Vice Chair of the Operations Committee. The Deputy Director and Operations Committee Chairs will determine if the requested change is minor or substantial. The Chairs and Deputy Director may approve minor changes.

For substantial proposed changes, a decision document including the opinions of the Chairs and the Deputy Director will be sent to the Operations Committee and the ACCSP Leadership Team of the Coordinating Council for review.

The ACCSP Leadership Team will decide to approve or reject the request for change and notify the Deputy Director, who will send a written notification to the Partner's principal investigator with a copy to the Operations Committee.

When a requested major amendment is submitted shortly before a Coordinating Council meeting, the approval of the amendment will be placed on the Council Agenda.

The Deputy Director will notify NOAA Grants of any change in scope of work for final approval for non-federal proposals, and the Partner will need to request a Change in Scope through Grants Online. Necessary communications will be maintained between the concerned Partner, the Program and NOAA Grants. Any changes must be approved through the normal NOAA Grants process.

Requesting a No-cost Extension

If additional time is needed to complete the project, Program Partners can request a no-cost extension to their award period. Partners should let the Program know of the need for additional time and then request the extension as an Award Action Request through NOAA Grants Online at least 30 days before the end date of the award.

Necessary communications will be maintained between the concerned Partner, the Program, and NOAA Grants office. Any changes must be approved through the normal NOAA Grants process.

Declaring Unused/Returned Funds

In an effort to limit the instances in which funds are not completely used during the award period, draw down reports from the NOAA Grants offices indicating remaining grant balances will be periodically reviewed during each fiscal year.

While effort should be made to complete the project as proposed, if Program Partners find that they will not be able to make use of their entire award, they should notify the Program and their NOAA Federal Program Officer as soon as possible. Depending on the timing of the action, the funds may be able to be reused within the Program, or they may have to be returned to the U.S. Treasury.

Program Partners must submit a written document to the Deputy Director outlining unused project funds potentially being returned. The Partner must also notify their Coordinating Council member (if applicable) for approval to return the unused funds. If the funding is available for re-use within the Program, the Director and Deputy Director will confer with the Operations Committee Chair and Vice-Chair and the Advisory Committee Chair, and then submit a written recommendation to the ACCSP Leadership Team of the Coordinating Council for final approval on the plan to distribute the returned money.

Necessary communications will be maintained between the concerned Partner, the Program, and NOAA Grants office. Any changes must be approved through the normal NOAA Grants process.

Reporting Requirements

Program staff will assess project performance.

The Partner project recipients must abide by the NOAA Regional Grant Programs reporting requirements and as listed below. All semi-annual and final reports are to include a table showing progress toward each of the progress goals as defined in Step 2b and additional metrics as appropriate. Also, all Partner project recipients will submit the following reports based on the project start date to the Deputy Director:

- Semi-annual reports (due 30 days after the semi-annual period) throughout the project period including time periods during no-cost extensions,
- One final report (due 90 days after project completion).
- Federal Partners must submit reports to the Deputy Director, and State Partners must submit reports to both the Deputy Director and the appropriate NOAA Grants office.

Program staff will conduct an initial assessment of the final report to ensure the report is complete in terms of reporting requirements. Program staff will serve as technical monitors to review submitted reports. NOAA staff also reviews the reports submitted via Grants Online.

A project approved on behalf of a Program Committee will be required to follow the reporting requirements specified above. The principle investigator (if not the Chair of the Committee) will submit the report(s) to the Chair and Vice Chair of the Committee for review and approval. The Committee Chair is responsible for submitting the required report(s) to the Program.

Joint projects will assign one principle investigator responsible for submitting the required reports. The principle investigator will be identified within the project proposal. The submitted reports should be a collaborative effort between all Partners involved in the joint project.

Project recipients will provide all reports to the Program in electronic format.

Partners who receive no-cost extensions must notify the Deputy Director within 30 days of receiving approval of the extension. Semi-annual and final reports will continue to be required through the extended grant period as previously stated.

Partners that have not met reporting requirements for past/current projects may not submit a new proposal.

A verbal presentation of project results may be requested. Partners will be required to submit copies of project specifications and procedures, software development, etc. to assist other Program Partners with the implementation of similar programs.

Report Format

Semi-Annual(s) – Progress Reports: (3-4 pages)

- Title page - Project name, project dates (semi-annual period covered and complete project period), submitting Partner, and date.
- Objective
- Activities Completed – bulleted list by objective.
- Progress or lack of progress of incomplete activities during the period of semi-annual progress – bulleted list by objective.
- Activities planned during the next reporting period.
- Metrics table
- Milestone Chart – original and revised if changes occurred during the project period.

Final Report:

- Title page – Project name, project dates, submitting Partner, and date.
- Abstract/Executive Summary (including key results)
- Introduction
- Procedures

- Results:
 - Description of data collected.
 - The quality of the data pertaining to the objective of the project (e.g. representative to the scope of the project, quantity collected, etc.).
 - Compiled data results.
 - Summary of statistics.
- Discussion:
 - Discuss the interpretation of results of the project by addressing questions such as, but not limited to:
 - What occurred?
 - What did not occur that was expected to occur?
 - Why did expected results not occur?
 - Applicability of study results to Program goals.
 - Recommendations/Summary/Metrics
- Summarized budget expenditures and deviations (if any).

Programmatic review

Project reports will inform Partners of project outcomes. This will allow the Program as a whole to take advantage of lessons learned and difficulties encountered. Staff will provide final reports to the appropriate Committee(s). The Committees then can discuss the report(s) and make recommendations to modify the Data Collection Standards as appropriate. The recommendations will be submitted through the Program committee(s) review process.


Appendix A: Maximum Funding for Maintenance Projects Entering Year 5 or 6 of Funding in FY23

Projects in Year 5 or 6 of Maintenance Funding	Calculated Base (4-year avg)	Maximum Funding Year 5	Maximum Funding Year 6 (Final Year)
Advancing Fishery Dependent Data Collection for Black Sea Bass (<i>Cetropristis striata</i>) in the Southern New England and Mid-Atlantic Region Utilizing Modern Technology and a Vessel Research Fleet Approach	\$132,229	\$88,153	

Appendix B: Ranking Criteria Spreadsheet for Maintenance and New Projects

Ranking Guide – Maintenance Projects:

Primary Program Priority	Point Range	Description of Ranking Consideration
Catch and Effort	0 – 10	Rank based on range within module and level of sampling defined under Program design. When considering biological, bycatch or recreational funding, rank according priority matrices.
Biological Sampling	0 – 10	
Bycatch/Species Interactions	0 – 6	
Social and Economic	0 – 4	
Data Delivery Plan	+ 2	Additional points if a data delivery plan to Program is supplied and defined within the proposal.

Project Quality Factors	Point Range	Description of Ranking Consideration
Multi-Partner/Regional impact including broad applications	0 – 5	Rank based on the number of Partners involved in project OR regional scope of proposal (e.g. geographic range of the stock).
> yr 2 contains funding transition plan and/or justification for continuance	0 – 4	Rank based on defined funding transition plan away from Program funding or viable justification for continued Program funding.
In-kind contribution	0 – 4	1 = 1% - 25% 2 = 26% - 50% 3 = 51% - 75% 4 = 76% - 99%
Improvement in data quality/quantity/timeliness	0 – 4	1 = Maintain minimum level of needed data collections  4 = Improvements in data collection reflecting 100% of related module as defined within the Program design. Metadata is provided and defined within proposal if applicable.
Potential secondary module as a by-product (In program priority order)	0 – 3 0 – 3 0 – 3 0 – 1	Ranked based on <u>single</u> additional module data collection and level of collection as defined within the Program design of individual module.
Impact on stock assessment	0 – 3	Rank based on the level of data collection that leads to new or greatly improved stock assessments.


Other Factors	Point Range	Description of Ranking Consideration
Properly Prepared	-1 – 1	Meets requirements as specified in funding decision document Step 2b and Guidelines
Merit	0 – 3	Ranked based on subjective worthiness

Ranking Guide – Maintenance Projects: (to be used only if funding available exceeds total Maintenance funding requested)

Ranking Factors	Point Range	Description of Ranking Consideration
Achieved Goals	0 – 3	Proposal indicates project has consistently met previous set goals. Current proposal provides project goals and if applicable, intermediate metrics to achieve overall achieved goals.
Data Delivery Plan	0 – 2	Ranked based if a data delivery plan to Program is supplied and defined within the proposal.
Level of Funding	-1 – 1	-1 = Increased funding from previous year 0 = Maintained funding from previous year 1 = Decreased funding from previous year
Properly Prepared	-1 – 1	-1 = Not properly prepared 1 = Properly prepared
Merit	0 – 3	Ranked based on subjective worthiness

Ranking Guide – New Projects:

Primary Program Priority	Point Range	Description of Ranking Consideration
Catch and Effort	0 – 10	Rank based on range within module and level of sampling defined under Program design. When considering biological, bycatch or recreational funding, rank according priority matrices.
Biological Sampling	0 – 10	
Bycatch/Species Interactions	0 – 6	
Social and Economic	0 – 4	
Data Delivery Plan	+ 2	Additional points if a data delivery plan to Program is supplied and defined within the proposal.

Project Quality Factors	Point Range	Description of Ranking Consideration
Multi-Partner/Regional impact including broad applications	0 – 5	Rank based on the number of Partners involved in project OR regional scope of proposal (e.g. fisheries sampled).
Contains funding transition plan / Defined end-point	0 – 4	Rank based on quality of funding transition plan or defined end point.
In-kind contribution	0 – 4	1 = 1% - 25% 2 = 26% - 50% 3 = 51% - 75% 4 = 76% - 99%
Improvement in data quality/quantity/timeliness	0 – 4	1 = Maintain minimum level of needed data collections  4 = Improvements in data collection reflecting 100% of related module as defined within the Program design. Metadata is provided and defined within proposal if applicable.
Potential secondary module as a by-product (In program priority order)	0 – 3 0 – 3 0 – 3 0 – 1	Ranked based on <u>single</u> additional module data collection and level of collection as defined within the Program design of individual module.
Impact on stock assessment	0 – 3	Rank based on the level of data collection that leads to new or greatly improved stock assessments.

Other Factors	Point Range	Description of Ranking Consideration
Innovative	0 – 3	Rank based on new technology, methodology, financial savings, etc.
Properly Prepared	-1 – 1	Meets requirements as specified in funding decision document Step 2b and Guidelines
Merit	0 – 3	Ranked based on subjective worthiness

Atlantic Coastal Cooperative Statistics Program

Coordinating Council

November 7, 2022

ACCSP Atlantic Recreational Implementation Plan – 2023-2027

Summary: This document was approved by the Operations Committee in September, 2022 and is provided to the Coordinating Council for consideration and action. This plan will guide [MRIP](#) in allocating resources to further improve to best address data needs of fishery assessors and managers in the Atlantic Coast region. The plan is also used by ACCSP in the annual [ACCSP funding process](#) to guide regional developments of recreational data collections that may not be addressed within the MRIP.

Note: Since the Council met in May, the priorities were re-ranked, and the use of citizen science was moved from a priority to a data collection tool supported to supplement census or survey methods, as appropriate.

The updated prioritized list of regionally important data needs are presented on pages 8-14.

- 1. Improved precision (PSE) and presentation of MRIP estimates**
- 2. Comprehensive for-hire data collection and monitoring**
- 3. Improved recreational fishery discard and release data**
- 4. Improved timeliness of MRIP recreational catch and harvest estimates**
- 5. Biological sampling for recreational fisheries separate from MRIP**
- 6. Improved in-season monitoring**

Background: Regional Recreational Implementation plans are developed for MRIP with ACCSP functioning as the Atlantic Coast Regional partner, and MRIP uses the 5-6 regional plans to set national priorities. These plans should be updated when a major change in regional priorities occurs, or every five years. As part of the MRIP Regional Implementation Council, ACCSP gathers input from our Partners (Commission, Councils, and states) on priority areas to direct resources. MRIP and ACCSP request that Partner priorities for recreational data collection are properly reflected in the Atlantic Regional Implementation Plan.

An example of how the current 2017-2022 Implementation plan was used is the work by MRIP to address Atlantic Priority 1 – Reduce PSE. Over the last 5 years, MRIP has developed data and survey standards for public presentation of MRIP data where cumulative estimates are intended to increase sample size and reduce the confidence intervals around point estimates. MRIP also secured additional funding via the Modern Fish Act resulting in \$900,000 per year to increase dockside sampling assignments for Maine to Georgia. Those sampling efforts became fully active in 2021. The overall sampling assignment increase was ~30%, with variability along the coast. MRIP, ACCSP, and the states worked together to allocate funds and assignments by APAIS sampling season length, species diversity, and fishing mode (Charter, Private-Rental, Shore).

Atlantic Coastal Cooperative Statistics Program

Atlantic Recreational Implementation Plan

2023 – 2027



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Background and Introduction

The Atlantic Coastal Cooperative Statistics Program (ACCSP) is a state-federal cooperative program to collect, manage, and disseminate statistical data and information on the marine and estuarine commercial and recreational fisheries of the Atlantic Coast. The ACCSP has provided coordination and data collection standards for recreational data collection efforts from Maine to Florida since 2004. The Marine Recreational Information Program (MRIP) of NOAA Fisheries was developed in 2008 out of the need to modify survey methods for collecting saltwater recreational fishery data for estimating fishery catch and effort for use by stock assessment scientists and marine fishery managers.

In 2013, the MRIP [Executive Steering Committee](#) adopted a hybrid [approach to implementation](#) (PDF, 45 pages). Under this approach:

- NOAA Fisheries maintains a central role in developing [data collection and estimation methods](#), administering [recreational fishing surveys](#), implementing [survey and data standards](#), and producing [recreational fisheries statistics](#).
- Regional and state partners identify [data collection priorities](#), coordinate survey operations and on-site data collection, and participate in [quality assurance and quality control procedures](#).
- The Marine Recreational Information Program's eight [Regional Implementation Teams](#) are responsible for publishing Regional Implementation Plans that identify regional information needs and recommendations for programmatic improvements.

As the MRIP evolved, the Atlantic region, through the ACCSP Partners have played a more active role MRIP planning, survey implementation, and pilot research projects to test new data collection techniques. The MRIP Access Point Angler Intercept Survey (APAIS) transitioned to Atlantic state conduct of field data collection with central administration, coordination, and data processing for Maine through Georgia provided by ACCSP staff in 2016 and the MRIP For-hire Telephone Survey (FHTS) and Large Pelagics Telephone (LPTS) Add-on followed in 2020. These MRIP surveys on the Atlantic Coast of Florida are also conducted by the state; however, they are coordinated along with the Gulf of Mexico coast by the Gulf States Marine Fisheries Commission (GSMFC). The ACCSP's Coordinating Council and Recreational Technical Committees of state, Commission, Council, and federal partners has developed this implementation plan in response to regional needs on the Atlantic Coast. This plan will guide [MRIP](#) in allocating resources to further improve to best address data needs of fishery assessors and managers in the Atlantic Coast region. The plan is also used by ACCSP in the annual [ACCSP funding process](#) to guide regional developments of recreational data collections that may not be addressed within the MRIP.

Baseline Assessment of Current Regional Data Collection Programs and Data Needs

MRIP General Survey

The MRIP is a data collection program that uses several regionally designed sampling surveys to collect representative data and produce statistically robust estimates of recreational fishing effort and catches. Complementary surveys covering recreational fishing for finfish in marine and estuarine waters by shore, for-hire and private boat anglers comprise the general survey design of the Atlantic Coast MRIP. The Fishing Effort Survey (FES) and For-Hire Telephone Survey (FHTS) provide data to produce angler effort estimates (trips per angler) and the Access Point Angler Intercept Survey (APAIS) provides individual angler catch data to produce

average catch rates by anglers. The two survey products are used to produce total catch and effort estimates by shore, for-hire and private boat anglers. This general survey design is conducted through a combination of the ACCSP, GSMFC, state partners, and federal contractors in Maine through Florida.

The main products of the MRIP general survey are bi-monthly, state level estimates of effort and catch for all saltwater finfish species encountered in the APAIS. Precise annual estimates of landings and discards are adequate for stock assessments of managed species for commonly encountered fishes. However, annual estimates at state and regional levels may lack adequate precision for species that are rarely intercepted in the general survey. For example, deep water fishing trips which target fewer common fish such as Tilefish, offshore of southeastern states, are rarely intercepted by the APAIS and so consistently precise catch estimates may not be available over a long time series. These bi-monthly and annual catch estimates may not be timely nor precise enough for monitoring and management of recreational fisheries with Annual Catch Limits (ACLs); however, bi-monthly estimates may be used to predict whether an ACL will be met before the end of a fishing year. Although the MRIP surveys are not intended or designed to provide in-season quota monitoring, more precise estimates on a shorter time scale (both sampling and production of estimates from data) would provide higher certainty in managing fisheries with established ACLs.

For-Hire Recreational Fishing Components of Atlantic MRIP

In addition to shore and private/rental boats, anglers that fish from for-hire charter vessels are interviewed at the dock when they are intercepted in the APAIS. The Atlantic APAIS also includes a separate mode for headboats (i.e., party boats), and interviews during these assignments are conducted at sea, so that detailed data from discarded fish may also be collected. The APAIS interviewer rides the headboat, observes anglers while they are fishing, and identifies, counts, and measures discarded fish. This protocol was adopted on the Atlantic Coast in 2005 following a year of preliminary testing and a pilot study in South Carolina.

Effort for both sectors of the for-hire recreational fishery (i.e., charter and headboats) is estimated through a weekly telephone survey of for-hire vessel operators, called the For-Hire Telephone Survey (FHTS). This telephone survey replaced the Coastal Household Telephone Survey (CHTS) for these sectors in 2004 and provides precise estimates of angler-effort by the same bi-monthly sampling periods, by state. In the Southeastern States (NC to FL), the headboat sector of the FHTS is replaced by a special survey program of NOAA Fisheries, the Southeast Regional Headboat Survey (SRHS). The SRHS utilizes a census logbook reporting method to produce bimonthly estimates of catch and effort for this portion of the for-hire fishing fleet.

MRIP General Survey Components – Future Focus Areas

Access Point Angler Intercept Survey (APAIS)

2022 APAIS sampling levels are adequate to produce precise annual regional catch estimates of many state-managed species based on recommended levels of precision identified as standards by the ACCSP. For specific fisheries, some state partners elect to conduct additional dockside APAIS assignments not funded through the MRIP to reduce variances of the catch estimates (as measured by Percent Standard Error (PSE)), including Massachusetts, Rhode Island, Delaware, North Carolina, and South Carolina. Atlantic states from Maine through Georgia conduct at-sea headboat assignments to collect angler interview and discard data. Beginning in 2021, additional Modern Fish Act (MFA) funding through NOAA Fisheries was made available for Atlantic states site assignments from Maine to Georgia. This increased the total number of APAIS assignments sampled by 30% with the target of improving estimate precision for all species. In the first year, this increase led to a 19% increase in the number of overall interviews. Atlantic states funding was distributed with a focus

on areas and fishing modes with longer seasons and greater species diversity, particularly those with routinely higher PSEs.

MRIP state conduct for Florida recreational fisheries is directed through the GSMFC. A large portion of the funds allocated to Florida were used to increase the number of assignments along the Atlantic and Gulf coasts in areas and fishing modes where PSEs have been historically high. The ACCSP annual reports to MRIP include tracking of indicator species PSE levels. However, additional analyses to quantify effectiveness of these additional assignments for reducing PSEs is needed to evaluate if sampling changes have met the data needs to support fisheries management.

The accuracy and precision of estimates for the released portion of recreational catch is an issue which still requires future attention. Currently in the modes sampled by the APAIS dockside survey, catch per unit effort (CPUE) information for discarded catch is based on angler recall of the number of each species released by each angler intercepted, and the accuracy of that recall at the dock is unknown. Furthermore, dockside intercept surveys are inadequate for collecting information about the size and condition of fish released at sea, which are critical data needs for stock assessments. APAIS protocols for at-sea sampling are adequate for headboats but, due to small fleets and higher costs, the number and variety of vessels eligible for at-sea observations of discards is small. APAIS protocols do not allow for at-sea sampling observations from charter and private boats. Without adequate data from those sectors on areas and depths fished, it is unknown whether the length frequency of discards observed from headboats is representative of the entire recreational boat fishery.

Fishing Effort Survey (FES)

Fishing effort for shore and private boat mode angling from Maine to Florida was historically collected through the CHTS. However, it was determined that the CHTS was biased and inefficient due to low response rates and an increasing number of households without landline telephones. As more people abandoned landlines for cellphones, a growing number of potential respondents became unreachable. For this reason, MRIP transitioned to a new methodology in 2018 to provide a more representative sample and explicitly account for bias. The FES is a mail survey that utilizes state recreational saltwater fishing license databases to target licensed anglers and the U.S. Postal Service address database to distribute surveys to unlicensed anglers. The FES uses a two-month recall design to collect data. Fishing effort estimates increased following the transition to FES, depending on the state and mode, and MRIP should continue to evaluate improvements to FES methodology in the future.

For-Hire Telephone Survey (FHTS)

The FHTS focuses specifically on estimating the numbers of angler trips in the charter boat and headboat fishing modes. Since implemented in 2000, the FHTS has resulted in improved effort estimates for charter and headboat modes of fishing, which has improved overall precision of catch estimates for the charter fleet. However, non-response rates in the FHTS remain a concern. To increase coverage, GARFO vessel trip reports (VTRs) are used to calculate MRIP effort estimates for the part of the fleet that reports via mandatory VTRs.

Atlantic states from Maine to Florida maintain the MRIP online Vessel Directory. Staff in Maine to Georgia complete calls via the ACCSP-hosted Assignment Tracking Application (ATA) which houses a Computer Assisted Telephone Interviewing system (CATI) and Florida conducts the FHTS in coordination with the GSMFC.

Some for-hire fisheries are exploring management as a distinct sector with their own allocation. However, current FHTS survey methodology does not meet the data monitoring needs for sector management options in for-hire fisheries. For this reason, the ACCSP has identified increased timeliness of catch and effort estimates as a high priority along with maintaining dockside sampling levels. Electronic logbooks have the capability to produce accurate and timelier catch and effort statistics when paired with dockside validation. The Mid-Atlantic Fishery Management Council (MAFMC) implemented mandatory electronic logbook reporting options for federally permitted charter and headboat vessels in 2018 and the South Atlantic Fishery Management Council (SAFMC) and New England Fishery Management Council (NEFMC) followed in 2021. These regulatory changes increase the burden on for-hire fishery participants when conducted in addition to the current FHTS methods. Modifications to the FHTS may be necessary to reduce reporting burden for those vessels included in MRIP certified data collection programs.

Special Surveys and Data Collection Programs

Highly Migratory Species

Highly Migratory Species (HMS) are federally managed billfish, tuna, and sharks that range along the entire Atlantic and Gulf of Mexico regions. NOAA Fisheries directly manages these species since they range across regional boundaries in US waters. A summary of the HMS-targeted data collection programs along the Atlantic Coast is provided below.

MRIP Large Pelagic Survey (Large Pelagic Intercept, Telephone, and Biological Surveys)

The Large Pelagic Survey (LPS) began in 1992 as a specialized survey program of rare event HMS species in support of domestic management and international treaties. The LPS includes several surveys: a targeted angler intercept survey, the Large Pelagic Intercept Survey, which is similar to the APAIS but only intercepts recreational and for-hire fishing trips which targeted HMS species; the Large Pelagic Telephone Survey, which is a list-frame sampling survey to produce angler effort estimates in the HMS/LPS fisheries; and the Large Pelagic Biological Survey, used to obtain biological samples for life-history parameter estimation, such as age, size, and sex distribution, as well as reproduction parameters. The collective surveys collect information to identify fishing effort and catch (harvest and discard) from vessels holding HMS permits, and is conducted from Maine to Virginia during the months of June through October.

HMS Catch Card Census – Maryland and North Carolina

Highly Migratory Species Catch Card Census programs began in 1998 to improve reporting compliance required of for-hire licenses or HMS permits, and to identify catch (harvest and discard). Two states have chosen to implement these census programs and are essentially the same in each state. The programs include private anglers as well as for-hire charter and headboat operators from Maryland and North Carolina holding a Charter/Headboat HMS permit. All recreationally landed Bluefin tuna, billfish, and swordfish must be reported via a catch card, regardless of waters fished (state or federal). Reporting of Bluefin tuna dead discards is also required, while the Maryland Catch Card program also collects data on shark landings.

HMS Catch Reporting Program

The HMS Catch Reporting program is used to identify harvest and dead discards of Bluefin tuna, as well as harvest of billfish and swordfish. This program operates from Maine through Texas and the Caribbean territories, covering private anglers as well as for-hire headboats and charter vessels holding Atlantic HMS permits for fishing in federal waters. Any vessel landing one of the species listed above is required to report

their catch within 24-hours after the end of the trip via an online reporting system on the HMS permits website, the HMS Catch Reporting Smartphone App, SAFIS eTrips, or telephone.

Atlantic HMS Tournament Registration and Reporting System (ATR)

All tournaments offering rewards or prizes for the catch or landing of Atlantic HMS are required to register with NMFS within 30 days of the start of the event, and must report all catch and the number of participating vessels for each day of the event within seven days of the completion of the event. Registration and reporting may be done via the online ATR portal, or via paper forms provided for download on the NMFS website. Data collected via the ATR system is used for ICCAT reporting purposes, and is one of the primary data sources for tracking the 250 billfish limit (included blue and white marlin and roundscale spearfish) imposed on the U.S. Atlantic recreational billfish fishery by ICCAT.

Reef Fish Species

Florida State Reef Fish Survey (SRFS)

The Florida SRFS began in July of 2020 and is a specialized recreational fishing survey, certified by MRIP, which provides more precise estimates of private boat effort and catch for reef fishes on the Gulf and Atlantic coasts of Florida. The survey uses angler intercept data collected through the APAIS, combined with additional assignments (drawn with the APAIS sample), which target reef fish trips to estimate CPUE at the angler trip level. A complementary mail survey of state saltwater fishing license holders with the State Reef Fish Angler designation directly estimates targeted fishing effort for reef fishes. That State Reef Fish Angler designation is required to legally harvest certain types of reef fishes¹ from a private boat. Under-coverage attributed to fishing effort by unlicensed anglers without the special reef fish designation is accounted for in the APAIS and supplemental intercept surveys.

South Atlantic Red Snapper Season Survey

Since 2017, during the South Atlantic Red Snapper season, the state of Florida conducts special surveys during short recreational season openings for Red Snapper in the South Atlantic that are designed to estimate in-season landings with high precision. Precise estimates are necessary to track the small annual catch limit (ACL), which allows for a very limited harvest season <10 days in duration (as few as 2-3 days in recent years). Private boat fishing effort and CPUE are monitored by surveying recreational boating activity in coastal inlets and conducting separate dockside interviews with boat parties as they return from trips. For-hire vessel operators with federal permits receive a data sheet in the mail that allows them to keep track of trips and catch, which is followed up by telephone calls after the season ends to collect data. In-season landings estimates help track the South Atlantic Red Snapper ACL and improve precision for stock assessments. Biological data collected from harvested fish, including length, weight, age, sex, and genomics also contribute to regional stock assessments.

For-hire Logbook Programs

The following items provide additional information on ongoing for-hire data collection programs along the Atlantic Coast associated with logbook reporting requirements. These data collection programs utilize logbooks for reporting details of individual recreational fishing trips in the for-hire fishery on the Atlantic Coast. Federally required (mandatory) reporting is linked to specific fishery management plans (FMPs) and permits to participate in the specific fisheries (e.g., groundfish through the Greater Atlantic Regional Fisheries

¹ Mutton Snapper, Yellowtail Snapper, Hogfish, Red Snapper, Vermillion Snapper, Gag, Red Grouper, Black Grouper, Greater Amberjack, Lesser Amberjack, Banded Rudderfish, Almaco Jack, and Gray Triggerfish

Office (GARFO)). Individual state logbook reporting programs may be comprehensive in scope or limited to fishery-specific data collections.

GARFO Vessel Trip Reporting For-hire Logbooks

Commercial and for-hire operators participating in New England and Mid-Atlantic fishery FMPs are required to report results of all fishing trips via VTR, a mandatory trip-reporting logbook data collection program administered by NOAA GARFO. Trip reports are required to be submitted within 48 hours. VTR data are incorporated into the MRIP bi-monthly effort estimates.

Southeast Region Headboat Survey (SRHS)

The SRHS was implemented in the South Atlantic in 1972 and extends from North Carolina through Florida. The survey focuses on producing landings and effort estimates from the federally permitted headboat fishery targeting offshore reef fishes. This data collection program includes mandatory electronic trip reporting by headboats on a weekly basis along with a dockside intercept program to validate reporting and obtain biological samples for age, growth, and reproductive parameters used in stock assessments. Federal regulations require only federally permitted boats to report to the SRHS so headboats without federal permits are not included. Headboats which do not have a federal permit are also not included in the FHTS which can represent a significant gap in coverage in regions where reef fishes are targeted in state waters.

The APAIS headboat at-sea sampling component is conducted in much of the same region that is covered by the SRHS (NC, SC and GA), although MRIP does not produce landings estimates for use by stock assessment or management for headboats in the South Atlantic. The state of Florida also conducts at-sea observer surveys of headboats on the Atlantic coast. The primary objective of at-sea headboat surveys in the South Atlantic is to provide size and species composition data for discards for use in regional stock assessments. These data collection programs overlap in time and space, however, the headboat catch estimates generated by MRIP apply to Maine - Virginia and the SRHS estimates for headboat catch are used from North Carolina - Florida.

Southeast For-hire Integrated Electronic Reporting (SEFHIER)

NOAA Fisheries implemented reporting requirements for more than 3,000 federally permitted for-hire vessels through the Southeast For-Hire Integrated Electronic Reporting (SEFHIER) program in January 2021. The purpose of this program is to enhance the timeliness and accuracy around the information about for-hire trips including catch, effort, and discards. All federal South Atlantic/Atlantic-only Charter/Headboat permitted vessels have been required to submit electronic trip reports since Jan. 5, 2021. These data are not currently referenced in MRIP methodology and estimates.

Maryland Charter Fisheries Logbook

The Maryland DNR charter logbook began in 1995 as a mandatory weekly reporting program for charter boats fishing for Striped Bass in Chesapeake Bay only. This program was modified to include reporting by vessels and/or captains holding several recreational fishery permits in MD: The Chesapeake Bay & Coastal Sport Charter Boat License, the Maryland Commercial Fishing Guide License, and/or the Maryland Unlimited Tidal Fish License. These permits and reporting requirements cover all species in the Chesapeake Bay and coastal Maryland waters. This program collects variables to determine fishing effort, and harvest, including weights from landed fish and catch disposition (e.g., released, landed, kept, regulatory release, etc.). Vessel operators are required to submit trip level reports on a weekly basis.

Maryland DNR provides the trip data to MRIP for those vessels selected in the FHTS to be used for effort estimation in lieu of telephone survey responses by Maryland vessel operators (who are not called by the FHTS). Maryland ocean-side for-hire vessel operators holding a federal for-hire vessel permit are required to submit VTRs to NOAA as well as the state reporting requirements. Hence, there is the potential for duplicative reporting by Maryland for-hire vessels fishing in coastal Atlantic waters.

Other state data collection programs

The following state logbook programs cover for-hire vessels in varying scope of vessels and fisheries in paper or electronic reporting forms. They are referenced here as areas for future coordination and possible integration if later certified by MRIP. Currently (2022), none of these programs are used in MRIP estimation:

- Rhode Island DFW via SAFIS eTrips and eLogbook
- Connecticut Party and Charter Vessel Black Sea Bass Program
- New York State Vessel Trip Reports via SAFIS eTrips
- New Jersey Striped Bass Bonus Program
- Virginia Cobia Permit Reporting Program & February Black Sea Bass Reporting Program
- South Carolina For-hire Logbook

Other logbook programs

- MAFMC Recreational Tilefish Permitting and Electronic Reporting (private angler)

For-hire Observer Programs

Note the Atlantic APAIS general survey includes at-sea observer data collection on headboats from Maine to Georgia (see APAIS section on page 2). Additional program(s) highlighted below.

Florida

Historically, for-hire observer coverage on the Atlantic coast of Florida was limited to large-party headboats. A cooperative research program for charter vessels was pilot tested in 2013-2015 with funding through MARFIN (Sauls and Ayala, 2020) and in 2021 observer coverage on the Atlantic coast of Florida was expanded to include the offshore charter fishery. Charter boat operators are voluntarily recruited into the survey and vessels are randomly selected each week to carry an observer during a single trip. Fishery observers collect information on the depth fished, gear used, types and sizes of fish retained and released, release methods, and the condition of released fish at each unique fishing location during a sampled trip. Some regulatory discards are marked with conventional tags prior to release. Data are used to monitor catch and release methods in the charter fishery, estimate discard mortality, and characterize the size distribution of discards for Southeast Data, Assessment, and Reviews (SEDARs).

Atlantic Regional Implementation Priorities to Meet Data Needs

The ACCSP solicited input from state and federal partners to develop the prioritized list of regionally important data needs.

- 4. Improved precision (PSE) and presentation of MRIP estimates**
- 5. Comprehensive for-hire data collection and monitoring**
- 6. Improved recreational fishery discard and release data**
- 7. Improved timeliness of MRIP recreational catch and harvest estimates**
- 8. Biological sampling for recreational fisheries separate from MRIP**
- 9. Improved in-season monitoring**

Priorities are described below to provide justification for the regional importance along with the approach for implementation and where possible, the estimated annual costs. Some priorities have associated MRIP-certified methodologies and action. However, some are included for utility in fisheries stock assessment and management. ACCSP will continue to update this plan as regional priorities change or methods to collect and utilize data evolve. The use of citizen science as a data collection tool is supported to supplement census or survey methods, as appropriate.

Costs of implementation may come in a form of tradeoffs other than dollars. With the move to cumulate estimates via the MRIP Recreational Fishing Survey and Data Standards in 2023, cumulative estimates throughout the year (e.g., January – July) will generally have lower PSEs than that of a single month's estimates. That is, if focusing on cumulative estimates throughout the year, each additional month might result in lower PSE as the year progresses and so the trade-off between smaller sample size (and thus likely higher PSEs) for a single month may not be as relevant. However, if monthly estimates are desired, the trade-off between PSE and timeliness would need to be considered (see "Improved timeliness of MRIP recreational catch and harvest estimates" section). ACCSP and MRIP partners are encouraged to develop proposals to address these data needs.

Improved precision (PSE) of MRIP catch estimates

For many managed species on the Atlantic Coast, MRIP estimates are reasonably precise at the annual and regional scale for interjurisdictional stock assessments. Inshore species that are frequently encountered in the APAIS survey also have reasonably precise state-level estimates for use in single jurisdiction assessments. However, regional estimates through 2021 for some species are not precise enough to meet fisheries assessment and management needs.

Managed species with chronically high PSEs have been prioritized for improvements. Historically, efforts to reduce PSE have primarily focused on increasing the APAIS sample size; however, ACCSP recommends that future resources continue to focus on targeted sampling design changes, alternative estimation approaches, and methods to optimize sampling effort (with strategic allocation of samples at existing or increased levels) to reduce PSEs to acceptable levels.

Progress has been made to address precision of MRIP estimates through the Modern Fish Act (MFA) increases to Atlantic APAIS and the adoption of MRIP Survey and Data Standards. Beginning in Wave 5, 2020 and fully implemented in 2021, the annual Atlantic APAIS sampling assignments have been increased by 30% supported by MFA funds. Similar funding in the Gulf region was allocated to increase APAIS sampling on the

Atlantic coast of Florida. Assignment increases were cooperatively developed between MRIP, ACCSP, GSMFC, and the states. Allocation of assignments was based on length of sampling season, species diversity, and mode of fishing.

It is unlikely that optimized sample allocation alone will address data needs for rare event species pulse fisheries or those with very small ACL's (e.g., tilefish, Red Snapper, Cobia, tuna, and billfish). Specialized data collection should also be developed to address these particularly problematic species. For example, alternative catch and effort surveys are necessary to track the ACL for Red Snapper over the harvest season which occurs over a period of days. Also, LPS and HMS catch card programs are an alternative method implemented to address low precision estimates for billfish and tuna. Methods should be developed to collect data from private anglers on species not sufficiently encountered by APAIS to develop precise-enough estimates through other means. As the need for reliable estimates increases for managed species under quotas, alternative survey methods could be developed for MRIP certification with a regional framework that is scalable.

Biological stock boundaries often do not coincide with state boundaries used to pre-stratify the MRIP APAIS and FES (e.g., the northern and southern Black Sea Bass stock split at Cape Hatteras, the Gulf of Maine and Georges Bank stocks of Atlantic Cod, the Long Island Sound management unit of Tautog, the Gulf and Atlantic stocks of many species separated at the Florida Keys). As a result, precise estimates of recreational removals for both input to stock assessments and annual quota monitoring would be beneficial to have at a finer scale and often with different boundaries than in MRIP's pre-stratified design.

There are several approaches to resolving this issue: (1) increase sample size to allow for more precise post-stratified estimates; (2) distribute base number of assignments to pre-stratified sub-state regions (as some states already do); and (3) further stratify the survey around important biological boundaries, which may require changes to the survey sampling schedule.

Post-stratification (using MRIP domain estimation) is the simplest approach, and methods to improve precision would also help improve the usability of finer spatial scale estimates. However, some boundaries cannot be resolved with post-stratification. For example, Monroe County (the Florida Keys) straddles two federal fishery management council jurisdictions and is a stock boundary for many assessments in the Gulf of Mexico and Atlantic. Currently in MRIP, all effort and catch for this county is assigned to west Florida estimates regardless of waters fished (note: Monroe County, Florida estimates are post-stratified for Black Grouper, Gag, Greater Amberjack, Mutton Snapper, Yellowtail Snapper, Blueline Tilefish, Nassau Grouper, Goliath Grouper, Snowy Grouper, and Red Grouper). Although county-level estimates of landings and discards may be post-stratified to reassign to the Atlantic, there is often a need to develop estimates of removals from this county by area fished (Gulf and Atlantic), and this is not possible with the current MRIP design. A combination of methods may be required to fully resolve this issue for all recreationally important species.

A related issue is the development and presentation of post-stratified estimates. Currently, MRIP offers SAS template programs to allow users to define custom domains to post-stratify estimates along appropriate biological or management boundaries. Developing web tools to allow users to obtain custom estimates, or estimates for a standardized set of regions with standardized, pre-defined boundaries, with the appropriate calibration factors applied, would improve usability and transparency of these estimates for use in stock assessments and the management process. These could be provided to all users through the current MRIP interface, or to a subset of more advanced users through the ACCSP Data Warehouse interface.

Expected costs: The ACCSP recommends the continuation of the MFA at \$900k per annum to continue supporting APAIS sampling and data presentation.

Comprehensive for-hire data collection and monitoring

For-hire catch and effort estimates combine distinct data collection methodologies for effort (FHTS) and catch (APAIS) with a validation component. This provides adequate coverage for commonly encountered species on an annual basis. However, FHTS and APAIS overlap with other mandatory reporting requirements varying by jurisdiction, such as federal VTRs, SRHS, and state or regional logbook programs. Some data streams are not fully integrated into MRIP estimates (preliminary and/or final). The current system has been criticized for increased reporting burden on captains, lack of integration of data collection to produce catch statistics, and under coverage of pulse fisheries and deep-water species.

Recent changes in fishery management practices have further strengthened the argument for the use of logbooks in the for-hire sector. The NEFMC, MAFMC, and SAFMC have implemented mandatory electronic for-hire reporting requirements to improve reporting. Federally permitted charter vessels are required to submit fishing activity via electronic logbooks within 48 hours of a fishing trip (NEFMC/MAFMC) or within 7 days of a fishing trip (i.e., weekly; SAFMC). These actions have allowed for logbook data collection to monitor both catch and effort data within the federally permitted for-hire sector.

ACCSP supports development of MRIP certified logbook programs with validation as one method to monitor catch and effort in the for-hire fishery. Logbook compliance with reporting requirements depends on effective outreach and enforcement mechanisms; however, logbook programs may not always be practicable due to legislative or regulatory hurdles or may not be preferred by fisheries managers, necessitating reliance on statistically-valid surveys instead. The critical need along the Atlantic Coast is to minimize overlapping for-hire fishery reporting programs. A Comprehensive For-hire Data Collection Program with full, but not duplicative, coverage of both federally and non-federally permitted boats needs to be implemented. Non-federally permitted boats include vessels that fish exclusively in state waters or for fishes not currently regulated via permits that have reporting requirements.

To meet future data collection and fishery monitoring needs, data collection must be timely, precise, cost effective, and minimize the reporting burden on captains and anglers. The ACCSP recommends this Comprehensive For-hire Data Collection Program continue development and certification efforts to ensure minimal reporting burden and to leverage data sharing among federal and state programs. Coverage shall include headboats and charter boats fishing in both state and federal waters, and methods may include logbooks where feasible, and alternative approaches to data collections for fishery monitoring where logbooks are not feasible or practicable. The implemented program should follow MRIP certified designs for logbooks with validation or sampling surveys.

In an effort to draft an Atlantic Comprehensive For-hire Data Collection Program, the RTC updated the ACCSP Data Standards with a set of minimum data standards for for-hire reporting and, with consultation from NOAA Fisheries, submitted a document to the MRIP certification process detailing the use of census logbook data with validation. Participating in the MRIP certification methodology is the first step in working towards the ability for for-hire recreational estimates to be calculated either through survey or census logbook. The RTC and NOAA Fisheries will continue to update the data standards and to progress within the MRIP certification process.

Recognizing various federal logbooks have been implemented, the Atlantic region needs completion and certification of a method to validate logbooks and further utilize logbook effort and catch in MRIP estimates. The new program shall meet the needs of statistical estimation, stock assessment, and fisheries management.

Expected costs: MRIP is not expected to cover costs of external logbook data collection programs. Maintaining funding for general survey FHTS and APAIS data collection will support the field component of the for-hire comprehensive program. However, there may be costs to MRIP staffing related to design review, data collection and estimation workloads that cannot be estimated at this time.

Improved recreational fishery discard and release data

In response to stock declines, fishery managers have taken regulatory steps to reduce harvest in the recreational sector, including increased size limits, reduced bag limits, and reduced recreational fishing seasons to ensure harvest levels do not exceed management targets. This has translated into a growing portion of recreational catch that is released at sea and unavailable for direct observation in dockside surveys. Numbers of discarded fish and accurate species identification of discarded fishes are more difficult to obtain with precision than harvested catch, due largely to the fact that current methods rely on angler recall.

Proper identification of discarded species is a requirement for any type of estimation of released fish. Studies have shown anglers have varying ability to identify their catch, including a study on the Pacific Coast that demonstrated anglers could reliably recognize Pacific Halibut and Sand Bass (unique body morphs without similar conspecifics) but had difficulty with rockfishes which encompass many species which are very similar in appearance. The Atlantic Coast region has similar species identification issues with flounders, kingfishes, sharks, and some reef fishes. Lack of angler expertise in proper identification of species requires they be reported at family or genus level groups. These grouped discarded species must be delineated into their constituent species prior to stock assessment to provide accurate and complete counts of all discards of a particular species. There is no standard method and little supplementary information to aid in these delineations. Given the regulatory status and differential stock health within these species groupings, accurate identification is paramount for holistic management. Supplemental surveys to ascertain the makeup of species within these groups should not be the only method for improving discard identification. Distribution of taxonomic keys or other fish identification guides or tools for these species, and an increase in angler education and outreach about proper fish identification, should be a priority part of any improved program for discarded fish identification, enumeration, and biological data collection. Citizen science may be used to capture discarded and released species and length frequency information.

The Atlantic APAIS has included a protocol specific to for-hire headboat at-sea discard monitoring and angler interviewing since 2005 wherein state interviewers directly observe recreational anglers as they fish on headboats and collect information on the species composition, size, and release condition of discards. Based on the success of projects funded to date, the use of at-sea observers in the headboat fishery has proven to be a viable method for collecting accurate data on discards that fills important data gaps in stock assessments. However, headboat sampling could be improved with an expanded frame of active, eligible vessels participating (currently voluntary participation within the APAIS), and an increased number of headboat fishing trips sampled. The ACCSP supports and recommends improvements to the current headboat at-sea sampling program to include more robust sample sizes to support better precision of discard rates and composition, and improved outreach efforts to increase participation by eligible headboats throughout the Atlantic Coast.

Discard data from headboat mode is not necessarily representative of other modes. Florida successfully pilot tested the use of fishery observers on charter boats on the Atlantic coast and recently secured state funding to support this monitoring long-term; however, expanding this to other Atlantic states may be limited by available funds. More information is also needed for private/rental and shore mode discards. While addition of observers on charter vessels might be too costly at this time and is not feasible for private boats, one modest improvement would be inclusion of depth fished in the intercept. The APAIS collects coarse trip-level data on the primary area fished (inland, state territorial seas up to 3 miles from shore, or federal waters greater than 3 miles from shore) but does not provide data on the depth fished. These data are critical for determining depth-dependent discard mortality for released portions of recreational catch.

Expected costs: Cannot be estimated at this time.

Improved timeliness of recreational catch and harvest estimates

There are two aspects of timing to consider regarding recreational catch and harvest estimates: the unit of estimation (i.e., month, two-month wave, cumulative, annual) and how quickly estimates are generated after an estimation period has ended. State and Commission managed species would benefit from monthly estimates to set seasons, especially in northern areas where fish may only be active during one month of a two-month wave, or for ephemeral fisheries where a species may pass through and be available for only one month (e.g., Cobia). This could be especially important to for-hire fishery captains as it could assist business planning. Also, even though MRIP was not designed to track ACLs, having more refined temporal estimates could help reduce gaps or buffers set between ACLs and Annual Catch Targets (ACTs), allowing anglers to harvest more fish by reducing uncertainty in landings. Both the 2016 and 2021 National Academy of Science (NAS) Review recommended additional evaluation of the cognitive properties of the two-month recall period, and a shorter estimation period would likely reduce any recall bias. APAIS data collection is already amenable to monthly recreational estimates and the FES was found to not have significant differences between one- and two-month recall periods (Andrews et al., 2018).

In terms of how quickly estimates are generated, currently annual estimates of catch and harvest are often not available until April of the following year and wave estimates are not available until 45 days after the completion of a wave. Improving the timeliness of recreational catch and harvest estimates could help fishery managers better predict when seasons need to be closed before landings are exceeded. Managers would also have more time to develop management options before decisions for an upcoming season must be made if a reduction in the lag time is achieved. Electronic data collection of both the APAIS and FHTS in 2019 and 2021, respectively, has allowed for quicker access to raw data for use in the estimation process and also improved the quality of data.

The trade-off between the additional cost of moving to monthly waves and/or faster turn-around time for generating estimates should be evaluated against budgeting for improved precision at the current two-month/annual levels and other recreational data priorities. Moving to one-month waves without additional sampling could result in monthly estimates of sufficiently low precision that having monthly estimates does not actually improve management. Andrews et al. (2018) discerned that, while there was no significant difference in effort estimates between a feasible one-month alternative to the FES and the current FES, multiple reference periods in a single survey may reduce bias for one-month estimates. In determining trade-offs of effort survey design, Andrews et al. (2018) recommend consideration be given to estimate precision, sampling requirements needed to support different levels of resolution, and also the impact of increased

sampling on survey costs. Given the change in data presentation to cumulative estimates in CY2023, the potential to change FES to monthly recall should be revisited.

Expected costs: Cannot be estimated at this time.

Biological sampling for recreational fisheries separate from MRIP

Fishery-dependent monitoring programs on the Atlantic Coast which collect vital statistics on catch and effort from the recreational fishery do not provide some of the critical data inputs needed for age-based stock assessments. The MRIP is the only dedicated coast-wide fishery dependent program that monitors private and for-hire charter boat-based segments of the recreational fishery. The MRIP strives to provide a statistically valid sample of the size composition and biomass of harvested finfish that is representative of the spatial and temporal distribution of the recreational fishery. However, for many important managed species, the MRIP survey intercepts low numbers of landed fish, particularly for species with strict harvest limits, such as Red Snapper, or that are targeted by a small subset of participants in the overall recreational fishery, such as tilefishes and deep-water grouper species. Furthermore, time constraints and strict interview procedures of the APAIS do not allow field interviewers to collect age structures or record sex from fish sampled.

Methods to supplement data collected through the APAIS are needed to collect length, weight, age structures and sex ratios from managed species that are representative of current recreational landings. Doing so does not necessarily require a uniform coast-wide approach, since biological sampling may be more efficient and cost effective when it is targeted at the scale appropriate for a given fishery. Biological sampling may be incorporated into supplemental surveys that are also needed to improve timeliness and precision of catch estimates for specialized fisheries. An example is the Red Snapper Season Survey that Florida has implemented to monitor in-season landings on the Atlantic coast, which also provides a unique opportunity to collect biological samples from large numbers of fish over a short sampling period. Supplemental survey(s) could be focused on intercepting trips with catch and maximizing biological samples, whereas the APAIS would continue to be the primary data source for catch-per-unit-effort. The supplemental survey(s) should also allow for the collection of trip-level data on area fished, depths fished, fishing methods, and characteristics of discards (numbers by species, proportions under legal size limits, immediate mortalities, and notable impairments).

Expected costs: Cannot be estimated at this time.

Improved in-season monitoring

Stock assessments may partition fishery removals into seasons or redefine calendar years into fishing years. Fishery managers also require precise estimates of landings and discards over time periods that better match the scale of the recreational fishery. For example, for federally managed species with an ACL that cannot be exceeded, recreational fisheries have demonstrated the capacity to exceed limits well before the end of a full year. Thus, annual seasons have been reduced and precise estimates are now needed over much shorter periods (in some cases weeks or days) to ensure that ACLs are not exceeded and overfishing is not occurring. Increasing precision of estimates within waves may be necessary for species where the unit of analysis has a temporal scale less than a year.

The MRIP is intended to be a general survey and is therefore not designed for the purposes of in-season management of recreational fisheries with ACLs. Improving timeliness of estimates is one feasible

method to improve ability to monitor in-season estimates but the cost of increasing sample sizes to produce precise enough estimates is high. Development of data collection as supplemental to MRIP also has the potential to address in-season monitoring, especially related to fisheries with short seasons. Additionally, it's possible that a different approach to management, rather than data collection method and/or supplemental surveys, would be more useful for species with small seasons and/or rare occurrences.

The 2021 NAS review of MRIP yielded several suggestions to assist with improving in-season monitoring including: using raw data streams of MRIP data, mode-based projecting and/or forecasting, further implementation of new technologies to better collect data, and using supplemental and ancillary data. Additionally, new recreational surveys and survey methods could be implemented but partners should anticipate the need for possible inter-calibration and continued survey development, ensuring that these needs are also clearly communicated to anglers, managers, and stakeholders. It will also be beneficial to continue pilot testing new approaches including the use of harvest tags or web-based reporting used to track the harvest of individual fish or private recreational fisheries license endorsements. These could be used to identify a subset of licensed anglers to better target managed species.

Expected costs: Cannot be estimated at this time.

Note on utility of citizen science to address data needs:

Citizen science was originally identified as a separate data priority but was later removed noting that citizen science as a tool to support data needs rather than its own individual priority. Angler-reported recreational fishing activity and catch, supplemental to the MRIP, continues to be an evolving aspect of engaging citizens in fisheries management and in helping to bolster the breadth of data collection for state, federal, council, and Commission partners. The ultimate use of citizen science data may be supplemental to MRIP in the assessment and management process, and may not include integration into the MRIP. Citizen Science data collection methods can assist with capturing changing spatial and temporal presence/absence of species and important species-length information. While productive for agency-public relationships, the vast majority of data collection tools (i.e., mobile applications) have not yet followed a standardized approach to data collection. A number of partners in the South Atlantic (e.g., 'Release' by the SAFMC and 'Catch U Later' by NC DMF) have collaborated with ACCSP to create these mobile-based applications on the Atlantic Coast and there are continued plans to further standardize data standards/elements. This could include the use of a 'switchboard' base application which can have a standard set of questions/responses to choose from to provide flexibility based on partners needs and could be submitted in the same format and data stream(s).

A more standardized approach to data collection via opt-in angler applications would provide more useful data for use in stock assessments by assuring data are collected in the same manner, regardless of where the data are being collected which in turn could allow for data users to potentially include opt-in angler reported information into the recreational fishery management process for management. In 2020, the RTC and ASMFC Assessment Science Committee preliminarily discussed data element needs and data utility of opt-in angler reported information, including the potential for biases and the difficulty in assuring data reliability for statistical use of data. Another major factor to be considered is the communication and outreach required to begin and maintain engagement from a broad segment of the angling public.

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May 2022 Committee Newsletter

This monthly newsletter is intended to keep all committee members informed of the activities and accomplishments of ACCSP committees and staff. ACCSP staff welcomes feedback on all content.



Upcoming Events

- **June 1:** Commercial Technical Committee Meeting
- **June 6:** Recreational Technical Committee Meeting
- **June 15:** Initial Proposals are due
- **June 22:** Initial proposals are distributed to Operations and Advisory Committees
- See [ACCSP Calendar Link](#) for more information

Coordinating Council

- Provided updated rankings for Atlantic Regional Recreational Implementation Plan, a document scheduled for completion and Council Action at the Annual Meeting in November.

- The ACCSP technical Committees have been working to update the 2012 Atlantic Coast Data Standards. This includes updating tables, figures, and language. As well as determining which sections will be dynamic and which will be static.
- The plan is to also update the way the Atlantic Coast Data Standards are presented and organized. The idea is to identify **dynamic** text – text that is frequently changing, vs. **static** text – text that does not change as frequently and does not have to be reviewed as often. Identifying dynamic text this will allow more response to changes in the industry, the standards, and the technical committees' level. The standards review is usually done every 5 years.
- ACCSP staff will need all feedback by August. The updated standards will then be presented to the Operations Committee and Advisory Committee in September, and finally presented to the Coordinating Council in October.

Status of Standards Review:

Bycatch Prioritization Committee: Review complete

Biological Review Panel Committee: Review in Progress, Next standards review meeting is pending.

Commercial Technical Committee: Review in Progress, Next standards review meeting June 1, 2022.

Recreational Technical Committee: Review in Progress, Next standards review meeting June 6, 2022.

Highlights



ACCSP
Announces
FY23 RFP

Request for Proposals

\$1.2 million is available to ACCSP Partner and Committee projects.

The Funding Decision Document provides an overview of the funding process and guidance for submitting proposals by June 15, 2022.

Editor: Marisa Powell

Please contact us if you have any questions or feedback at info@accsp.org.



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June 2022 Committee Newsletter

This monthly newsletter is intended to keep all committee members informed of the activities and accomplishments of ACCSP committees and staff. ACCSP staff welcomes feedback on all content.



Upcoming Events

- **July 13:** Commercial Technical Committee Meeting
- **July 14:** Operations and Advisory Committees Meeting
- **August 2-4:** ASMFC Meeting
- See [ACCSP Calendar Link](#) for more information

The Recreational Technical Committee (RTC) held a call on June 6th to:

- A. Finalize the revised static text portions of the ACCSP Recreational and For-hire Data Standards, the dynamic data element sections will be revised in 2023.
 - B. Finalize a proposed methodology for the creation of for-hire logbook estimates of both catch and effort with the use of a dockside validation component to NOAA Fisheries with the intention of movements towards MRIP certification. Note this was submitted to MRIP for consideration after the RTC call and the ACCSP will work with MRIP on next steps.
 - C. Discuss the recent, combined ranking of priorities of the 2023-2027 Atlantic Recreational Implementation Plan which will help guide MRIP allocation of resources to best address data needs of recreational fisheries.
 - D. Request ideas for inclusion in the annual ACCSP Request for Proposal (RFP).
 - E. There was a transition of the Recreational Technical Committee Chair from Greg Wojcik (CT) to Angela Giuliano (MD), and the nomination of a new Vice-Chair Dawn Franco (GA).
- The Recreational Technical Committee will meet again in October/November of 2022 to reflect on recent efforts and set direction for 2023-forward.

Highlights

ACCSP RE-OPENS FY23 RFP

DEADLINE AUGUST 17



- Opportunity to utilize available funds
- Support Partner needs
- Encourage new proposals
- Equally consider all proposals received

SUBMISSIONS:

Please submit proposals to
Julie DeFilippi Simpson, ACCSP Deputy Director
julie.simpson@accsp.org.

MORE INFORMATION

CLICK



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July 2022 Committee Newsletter

This monthly newsletter is intended to keep all committee members informed of the activities and accomplishments of ACCSP committees and staff. ACCSP staff welcomes feedback on all content.



Upcoming Events

- **August 2-4:** ASMFC Meeting
- See [ACCSP Calendar Link](#) for more information

- NEFSC would like to review the current “common name” for SAFIS species-codes. This would be to ensure other agencies are aware of the possible data cleanup that may be needed in the future.

Highlight

ACCSP FY23 RFP STILL OPEN

ACCSP encourages new proposals.
The FY23 RFP process remains
open til August 17th.

Submissions



**Deadline: August 17,
2022**



**Please submit proposals to
Julie DeFilippi Simpson,
ACCSP Deputy Director
Julie.Simpson@accsp.org**



**ACCSP WISHES EVERYONE A
HAPPY & SAFE SUMMER!**

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August 2022 Committee Newsletter

This monthly newsletter is intended to keep all committee members informed of the activities and accomplishments of ACCSP committees and staff. ACCSP staff welcomes feedback on all content.



Upcoming Events

- **September 20-21:** Joint Operations and Advisory Committees Meeting
- See [ACCSP Calendar Link](#) for more information

dynamic format, and reference best practices outlined by the ACCSP Accountability subgroup.

Highlight

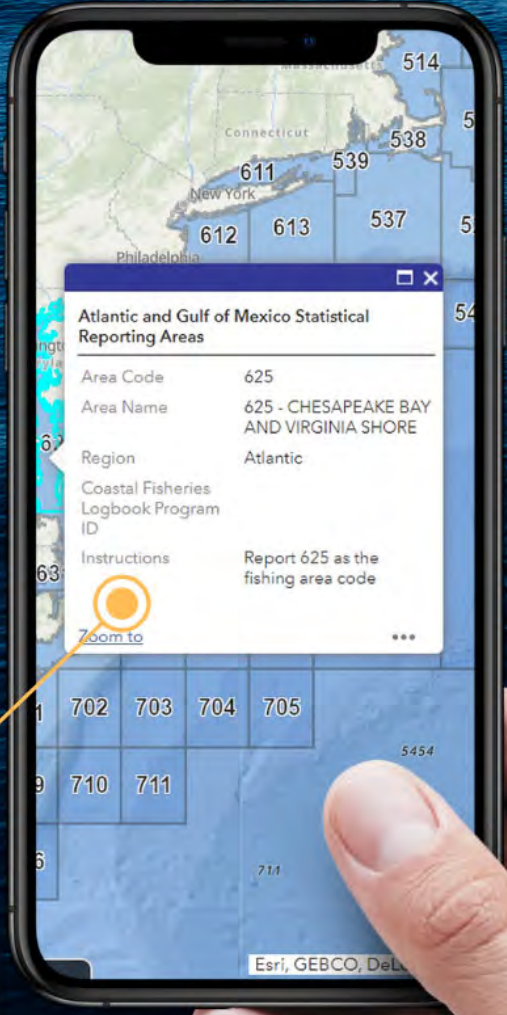
Check it out

ACCSP

Interactive Fishing Map

Available Layers:

- Atlantic and Gulf of Mexico Statistical Reporting Areas
- Ten minute grid
- Lobster Management Areas
- NOAA Nautical Chart
- ****New**** Updates more frequently
- State Reporting Areas
 - Maine
 - Massachusetts
 - Rhode Island
 - Connecticut
 - New York
 - New Jersey
 - Virginia
 - North Carolina
 - South Carolina ****NEW****
 - Florida



NEW

Instructions Report 625 as the fishing area code

Editor: Marisa Powell

Please contact us if you have any questions or feedback at info@accsp.org.



Atlantic States Marine Fisheries Commission

Atlantic Striped Bass Management Board

November 7, 2022

3:00 – 5:30 p.m.

Hybrid Meeting

Draft Agenda

The times listed are approximate; the order in which these items will be taken is subject to change; other items may be added as necessary.

- | | |
|---|-----------|
| 1. Welcome/Call to Order (<i>M. Gary</i>) | 3:00 p.m. |
| 2. Board Consent | 3:00 p.m. |
| • Approval of Agenda | |
| • Approval of Proceedings from August 2022 | |
| 3. Public Comment | 3:05 p.m. |
| 4. Consider 2022 Atlantic Striped Bass Stock Assessment Update | 3:15 p.m. |
| • Presentation of Stock Assessment Report (<i>G. Nelson</i>) | |
| • Consider Management Response, If Necessary Possible Action | |
| 5. Consider Draft Addendum I on Quota Transfers for Public Comment (<i>E. Franke</i>) Action | 4:25 p.m. |
| 6. Review and Populate Advisory Panel Membership (<i>T. Berger</i>) Action | 5:25 p.m. |
| 7. Other Business/Adjourn | 5:30 p.m. |

The meeting will be held at The Ocean Place Resort (1 Ocean Boulevard Long Branch, NJ; 732.571.4000) and via webinar; click [here](#) for details

MEETING OVERVIEW

Atlantic Striped Bass Management Board

November 7, 2022

3:00 p.m. – 5:30 p.m.

Hybrid

Chair: Marty Gary (PRFC) Assumed Chairmanship: 01/22	Technical Committee Chair: Nicole Lengyel Costa (RI)	Law Enforcement Committee Rep: Kurt Blanchard (RI)
Vice Chair: Megan Ware (ME)	Advisory Panel Chair: Louis Bassano (NJ)	Previous Board Meeting: August 2, 2022
Voting Members: ME, NH, MA, RI, CT, NY, NJ, PA, DE, MD, DC, PRFC, VA, NC, NMFS, USFWS (16 votes)		

2. Board Consent

- Approval of Agenda
- Approval of Proceedings from August 2022

3. Public Comment – At the beginning of the meeting, public comment will be taken on items not on the agenda. Individuals that wish to speak at this time must sign-in at the beginning of the meeting. For agenda items that have already gone out for public hearing and/or have had a public comment period that has closed, the Board Chair may determine that additional public comment will not provide additional information. In this circumstance, the Chair will not allow additional public comment on an issue. For agenda items that the public has not had a chance to provide input, the Board Chair may allow limited opportunity for comment. The Board Chair has the discretion to limit the number of speakers and/or the length of each comment.

4. 2022 Stock Assessment Update for Atlantic Striped Bass (3:15-4:25 p.m.) Possible Action

Background

- The 2022 stock assessment update was completed in October 2022 (**Briefing Materials**).

Presentations

- Assessment overview by G. Nelson

Board actions for consideration at this meeting

- If necessary, consider management response to the 2022 stock assessment update.

5. Draft Addendum I on Quota Transfers (4:25-5:25 p.m.) Action

Background

- In August 2021, the Board initiated the draft addendum to consider allowing voluntary transfers of commercial striped bass quota in the ocean region between states that have commercial quota.
- The draft addendum was initiated as a way to consider providing more immediate relief for states instead of pursuing a full quota allocation discussion.

- In August 2022, the Board provided additional guidance to the Plan Development Team (PDT) to address concerns previously raised regarding transfers, and to add provisions that would allow the Board to set certain parameters for quota transfers each year.
- The PDT developed a revised Draft Addendum I for Board review and provided a memo outlining PDT updates and considerations (**Supplemental Materials**).

Presentations

- Overview of Draft Addendum I for public comment by E. Franke

Board actions for consideration at this meeting

- Approve Draft Addendum I for public comment.

6. Advisory Panel Membership (5:25-5:30 p.m.) Action

Background

- Craig Poosikian, a commercial rod and reel fisherman from Massachusetts, has been nominated to the Atlantic Striped Bass Advisory Panel.

Presentations

- Nomination by T. Berger

Board actions for consideration at this meeting

- Approve Atlantic Striped Bass Advisory Panel nomination.

7. Other Business/Adjourn (5:30 p.m.)

Atlantic Striped Bass

Activity level: High

Committee Overlap Score: Medium (TC/SAS/TSC overlaps with BERP, Atlantic menhaden, American eel, horseshoe crab, shad/river herring)

Committee Task List

- SAS/TC – Conducting the 2022 stock assessment update
- TC – June 15th: Annual compliance reports due

TC Members: Michael Brown (ME), Kevin Sullivan (NH), Gary Nelson (MA), Nicole Lengyel Costa (RI), Kurt Gottschall (CT), Caitlin Craig (NY), Brendan Harrison (NJ), Tyler Grabowski (PA), Margaret Conroy (DE), Alexei Sharov (MD), Luke Lyon (DC), Ingrid Braun (PRFC), Joshua McGilly (VA), Charlton Godwin (NC), Jeremy McCargo (NC), Peter Schuhmann (UNCW), Tony Wood (NMFS), Steve Minkinen (USFWS), John Ellis (USFWS), Katie Drew (ASMFC)

SAS Members: Michael Celestino (NJ, Chair), Gary Nelson (MA), Alexei Sharov (MD), Hank Liao (VMRC), John Sweka (USFWS), Margaret Conroy (DE), Katie Drew (ASMFC)

Tagging Subcommittee (TSC) Members: Angela Giuliano (MD), Beth Versak (MD), Brendan Harrison (NJ), Chris Bonzek (VIMS), Gary Nelson (MA), Ian Park (DE), Jessica Best (NY), Josh Newhard (USFWS), Julien Martin (USGS), Katie Drew (ASMFC)

**DRAFT PROCEEDINGS OF THE
ATLANTIC STATES MARINE FISHERIES COMMISSION
ATLANTIC STRIPED BASS MANAGEMENT BOARD**

**Westin Crystal City
Arlington, Virginia**

August 2, 2022

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INDEX OF MOTIONS

1. **Approval of Agenda** by consent (Page 1).
2. **Approval of Proceedings of May 4, 2022** by consent (Page 1).
3. **Move to approve the Atlantic Striped Bass FMP Review and state compliance for the 2021 fishing year** (Page 12). Motion by Mike Luisi; second by Emerson Hasbrouck. Motion carried (Page 12).
4. **Move to add the following provisions to Draft Addendum I to Amendment 7 under Option B Commercial quota transfer provision of the coastal commercial quota:**
 - **The Board will decide by their final meeting of the year, based on the information the Board has available on the status of the striped bass stock and performance of the commercial fishery, whether to allow commercial quota transfers in the next year.**
 - **If the Board approves commercial quota transfers, the Board may decide to limit the transferable amount of quota to a set poundage or a set percentage of the total commercial quota.**
 - **The Board may also choose to specify the following criteria:**
 - **The eligibility of a state to receive a transfer based on percentage of that state's quota landed (e.g., state may not request quota until it has landed 90% of its annual quota).**
 - **The allocation of allowed transferable quota among seasonal fisheries (e.g. 50% reserved for states that have spring fisheries, 50% reserved for states with summer or fall fisheries).**

Motion by John Clark; second by Eric Reid (Page 46). Motion approved by consent (15 in favor, 1 abstention) (Page 49).
5. **Move to adjourn** by consent (Page 49).

ATTENDANCE

Board Members

Megan Ware, ME, proxy for P. Keliher (AA)	Tom Fote, NJ (GA)
Steve Train, ME (GA)	Kris Kuhn, PA, proxy for T. Schaeffer (AA)
Cheri Patterson, NH (AA)	Loren Lustig, PA (GA)
Ritchie White, NH (GA)	G. Warren Elliott, PA (LA)
Dennis Abbott, NH, proxy for Sen. Watters (LA)	John Clark, DE (AA)
Nichola Meserve, MA, proxy for D. McKiernan (AA)	Roy Miller, DE (GA)
Dan McKiernan, MA (AA)	Craig Pugh, DE, proxy for Rep. Carson (LA)
Raymond Kane, MA (GA)	Mike Luisi, MD, Administrative proxy
Sarah Ferrara, MA, proxy for Rep. Peake (LA)	Robert Brown, MD, proxy for R. Dize (GA)
Jason McNamee (AA)	David Sikorski, MD, proxy for Del. Stein (LA)
David Borden, RI (GA)	Pat Geer, VA, proxy for J. Green (AA)
Eric Reid, RI, proxy for Sen. Sosnowski (LA)	Bryan Plumlee, VA (GA)
Justin Davis, CT (AA)	Chris Batsavage, NC, proxy for K. Rawls (AA)
Bill Hyatt, CT (GA)	Jerry Mannen, NC (GA)
Sen. Craig Miner, CT (LA)	Marty Gary, PRFC
Jim Gilmore, NY (AA)	Dan Ryan, DC, proxy for C. Rese
Emerson Hasbrouck, NY, (GA)	John Coll, USFWS
Joe Cimino, NJ (AA)	Max Appelman, NMFS

(AA = Administrative Appointee; GA = Governor Appointee; LA = Legislative Appointee)

Ex-Officio Members

Mike Celestino, Stock Assmnt. Subcommittee Chair

Staff

Bob Beal	Katie Drew	Chris Jacobs
Toni Kerns	Maya Drzewicki	Jeff Kipp
Tina Berger	Emilie Franke	Adam Lee
Kristen Anstead	Lisa Havel	Sarah Murray
Lisa Carty		

Guests

Mike Armstrong, MA DMF	Ingrid Braun, PRFC	Nicole Lengyel Costa, RI DEM
Jerry Audet, InDeepOutdoors	Andrew Briggs	Caitlin Craig, NYS DEC
Pat Augustine, Coram, NY	James Burns	Brendon Curley
Megan Barrow, NYS DEC	Craig Cantelmo	Christopher Davis, VMRC
John Bello	Michael Celestino, NJ DEP	Patrick Denno
Susan Bertoline	Matt Cieri, ME DMR	Greg DiDomenico
Jessica Best, NYS DEC	Germain Cloutier	Evan Dintaman
Alan Bianchi, NC DENR	Margaret Conroy, DE DFW	Russell Dize, MD (GA)
Christopher Borgatti	Heather Corbett, NJ DEP	Paul Eidman, NJ

Guests (continued)

John Ellis, US FWS
James Fletcher
Anthony Friedrich
Tony Friedrich, ASGA
Tom Fuda
John Gans, TRCP
Shaun Gehan, Gehan Law
Lewis Gillingham, VMRC
Angela Giuliano, MD DNR
Alixandra Godar, USGS
Kurt Gottschall, CT DEEP
Pam Lyons Gromen, WildOceans
Brendan Harrison, NJ DEP
Helen Takade-Heumacher, FWS
Jaclyn Higgins, TRCP
Greg Hinks, NJ DEP
Carol Hoffman
Brett Hoffmeister, MA
Jeffrey Horne, MD DNR
Jesse Hornstein, NYS DEC
Edward Houdee, UMD CES
Jacob Jaskiel
Gary Jennings, FL, (AA)
Aidan Kaiser-Bulmash
Brian Kelly, MA DMF
Gregg Kenney, NYS DEC
Dale Kirkendall
Thomas Kosinski
Nils Larson
Brooke Lowman, VMRC
J A Macfarlan, RI DEM

Shanna Madsen, VMRC
John Maniscalco, NYS DEC
Genine McClair, MD DNR
Joshua McGilly, VMRC
Kevin McMenamin
Steve Meyers
Mike Millard
Henry Millken, NOAA
Steve Minkkinen, US FWS
Jack Molmud, NewsCenter ME
Chris Moore, CBF
Timothy Murphy
Allison Murphy, NOAA
Brian Neilan, NJ DEP
Lindsey Nelson, NOAA
Robert Newberry
Thomas Newman, NC
George O'Donnell, MD DNR
Virginia Olsen, Local 207
Scott Olszewski, RI DEM
Derek Orner, NOAA
Patrick Paquette
Nick Popoff, US FWS
Will Poston, ASGA
Jill Ramsey, VMRC
Harry Rickabaugh, MD DNR
Courtney Roberts
Jason Rock NC DENR
Mike Ruccio, NOAA
Zachary Schuller, NYS DEC
Ethan Simpson, VMRC

Melissa Smith, ME DMR
Ross Squire
Michael Stangl, DE DFW
Lauren Staples, NH F&G
Anthony Stefanski
David Stormer, DE DFW
Kevin Sullivan, NH F&G
John Sweka, US FWS
Colin Temple
Lou Tirado
Andrea Tomlinson
Chris Uraneck, ME DMR
Taylor Vavra, Stripers Forever
Beth Versak, MD DNR
Mike Waine, ASA
Craig Weedon, MD DNR
Peter Whelan
Meredith Whitten, NC DENR
Kate Wilke, TNC
John Page Williams
Wally Williams
Joseph Wilson, Endicott, NY
Charles Witek, NY
Rich Wong, DE DFW
Michael Woods
Chris Wright, NOAA
Dan Zapf, NC DENR
Jordan Zimmerman, DE DFW
Erik Zlokovitz, MD DNR
Renee Zobel, NH F&G

Draft Proceedings of the Atlantic Striped Bass Management Board Webinar
August 2022

The Atlantic Striped Bass Management Board of the Atlantic States Marine Fisheries Commission convened in the Jefferson Ballroom of the Westin Crystal City Hotel, Arlington, Virginia, via hybrid meeting, in-person and webinar; Tuesday, August 2, 2022, and was called to order at 2:00 p.m. by Chair Martin Gary.

CALL TO ORDER

CHAIR MARTIN GARY: Welcome everyone! Welcome to the Atlantic States Marine Fisheries Commission Atlantic Striped Bass Management Board. My name is Marty Gary; I'm your Board Chair, and our Vice-Chair is Ms. Megan Ware from Maine, and we are joined on my right by our fishery management plan coordinator, Emilie Franke, and Dr. Katie Drew for ASMFC staff.

This is a hybrid meeting of the Striped Bass Management Board. Before we get going in earnest here, just wanted to recognize Mr. John Coll from the U.S. Fish and Wildlife Service. John, welcome, you are proxy for Rick Jacobson, so welcome and thanks for joining us. Also, before we get going, I know at our last meeting in May we got through Amendment 7, thanks to the great work by Emilie and Katie and all the ASMFC staff.

But, Emilie wasn't able to join us and it was such an incredible effort she put on through, all the work that went into the hearings and all. I just wanted to revisit that one more time. Emilie, thank you so much for a great job. Thank you!

APPROVAL OF AGENDA

CHAIR GARY: We'll go ahead and get started, and our first order of business is Approval of the Agenda.

I would ask if there are any additions or modifications to the agenda. Seeing none; the agenda is approved by consent.

APPROVAL OF PROCEEDINGS

CHAIR GARY: Next, we'll approve the proceedings from the May 2022 meeting. I will note that staff

was notified that a Board member's name needed to be corrected under the Index of Motions on Page 3 of the proceedings.

I believe that change has been made, and I would ask, are there any other edits to the proceedings from the May, 2022 meeting? Seeing none; the proceedings from May, 2022 are approved.

PUBLIC COMMENT

CHAIR GARY: Next, we'll go to Public Comment for items that are not on the agenda, and I'm going to go ahead and look to see if there are any raised hands from the public that are in attendance.

Would anybody like to make comments for items not on the agenda? Not seeing anyone, and I would look to Emilie and Katie if there is anybody online that would like to. None, okay.

**CONSIDER OF FISHERY MANAGEMENT PLAN
REVIEW AND STATE COMPLIANCE FOR THE
2021 FISHING YEAR**

CHAIR GARY: All right, we'll move right along. Our next item is Item Number 4 in your agenda. It's Consideration of Fishery Management Plan Review and State Compliance for the 2021 Fishing Year, and I'll turn it over to Emilie.

MS. EMILIE FRANKE: It's great to meet so many of you in person today. I will provide an overview of the Fishery Management Plan Review for Fishing Year 2021, and the PRT Review, State Compliance Reports and compile this FMP Review, and those were included in the supplemental materials.

There is a lot of detail in the written report. In today's presentation I'll highlight some of the main points on the status of the stock, the status of the FMP, the status of the fishery, the status of current management measures, as well as the Plan Review Team's comments and recommendations.

The Board action for consideration today is to approve the FMP Review for Fishing Year 2021 and the State Compliance Reports. Starting with the

These minutes are draft and subject to approval by the Atlantic Striped Bass Management Board.
The Board will review the minutes during its next meeting

status of the stock. Based on the results of the 2018 benchmark stock assessment the stock is overfished, and experiencing overfishing. The 2018 assessment included data through 2017, and included the recalibrated MRIP estimates.

In 2017 female SSB was estimated at just over 68,000 metric tons, which was below both the target and the threshold, and fishing mortality was estimated at 0.31, which was above both the target and threshold for fishing mortality. As we'll talk about a little bit later, the next stock assessment, the 2022 assessment update is currently in progress, and those results are expected in October of this year.

This figure shows the spawning stock biomass in blue, and Age 1 recruitment in the orange bars. You can see that female SSB has declined since the high in 2003, and has been below the threshold since 2013. For recruitment there has been a period of low recruitment since about 2005, but there have been some strong year classes, including the 2011-, 2014-, and 2015-year classes.

Then for fishing mortality on the next slide, you can see that fishing mortality was estimated to be at or above the threshold, which indicates overfishing is occurring in 13 out of the last 15 years. Moving on to the status of the fishery management plan. Fishing Year 2021 was the second year of Addendum VI implementation.

Addendum VI implemented measures to reduce total removals by 18 percent relative to 2017, in order to achieve the fishing mortality target. Those Addendum VI measures were implemented by April 1, 2020. They reduced commercial quota levels by 18 percent, implemented a 1-fish bag limit, and a 28 to less than 35-inch slot limit for ocean recreational fisheries, and a 1-fish bag limit and 18-inch minimum size for Chesapeake Bay recreational fisheries.

Some states did implement alternative regulations through conservation equivalency, which were designed to achieve an 18 percent reduction at the state level. Addendum VI also requires the

mandatory use of circle hooks when fishing recreationally for striped bass with bait, to address recreational release mortality. Those Addendum VI measures were required to be implemented by January, 2021. Then in March 2021 last year, the Board clarified the definition of bait and methods of fishing when circle hooks are required. This is a compliance criterion for Addendum VI. The Board also provided guidance on the incidental catch of striped bass when targeting other species with non-circle hooks with bait attached. Then as far as updates to the FMP, as was discussed last meeting, Amendment 7 was approved just a few months ago in May.

Amendment 7 builds on this Addendum VI action to address overfishing, and initiate stock rebuilding. Amendment 7 establishes new requirements for management triggers, conservation equivalency, measures to address recreational release mortality, and the stock rebuilding plan. All the Amendment 7 provisions were effective immediately, May 5, 2022, except for the gear restrictions addressing release mortality.

States have to implement those new gear restrictions by January 1, 2023. Moving on to the fisheries. This figure shows fishery removals over time in numbers of fish by sector. You can see at the bottom, commercial harvest in blue and commercial discards in red. Those have been relatively stable over time.

You can see most removals are coming from the recreational sector, including recreational harvest in green, and recreational release mortality in purple. In 2021 total striped bass removals were estimated at 5.1 million fish, which is about the same as removals in 2020. It was less than a 1 percent increase from the removals we saw in 2020.

Here on the screen here is the proportion of total removals by sector over the past few years. In 2021 commercial harvest accounted for 12 percent of removals. Commercial dead discards accounted for less than 2 percent of total removals, and on the recreational side harvest accounted for 36 percent of total removals and recreational release mortality

These minutes are draft and subject to approval by the Atlantic Striped Bass Management Board.
The Board will review the minutes during its next meeting

accounted for 50 percent of total removals.

To the commercial fishery specifically, in 2021 the commercial fishery harvested an estimated 4.29 million pounds, just over 577,000 fish, which was an 18 percent increase by weight relative to commercial harvest in 2020. The Chesapeake Bay accounted for about 57 percent of that commercial harvest by weight.

Commercial discards overall, as I mentioned, were less than 2 percent of total striped bass removals. The PRT noted that the ocean commercial quota utilization increased to 76 percent of the quota used in 2021. This is the highest ocean quota utilization in the past five years. Here on the screen and in the report is the state-by-state quota and harvest accounting.

In 2021 about 1.8 million pounds were commercially harvested in the ocean, which is less than the 2.4 million pounds total ocean quota. In the Chesapeake Bay about 2.4 million pounds were commercially harvested, which is less than the about 3-million-pound Chesapeake Bay quota. In the last column highlighted in orange, you can see the quota utilization for each state.

I highlighted in orange here those ocean states that used a very high percent of their commercial quota this year. You can see a lot of states used up to 98 or 99 percent of their quota this year, except for North Carolina, which had zero harvest again in 2021. On the recreational side, total recreational harvest in 2021 was 1.82 million fish, which was about 15.7 million pounds. This is about a 6 percent increase in numbers of fish harvested relative to 2020. As we've discussed, the vast majority of recreational striped bass catch is released alive, and the assessment assumes 9 percent of those fish released die as a result of that interaction. In 2021 an estimated 28.6 million fish were caught and released alive, and of those 2.6 million are assumed to have died.

Overall, the number of live releases in 2021 was about a 7 percent decrease coastwide as compared to 2020. The PRT did note that there were different

trends by region. In 2021 the ocean region saw an increase in recreational harvest, live releases, and a slight increase in striped bass directed trips relative to 2020.

On the other hand, the Chesapeake Bay saw a decrease in all of those categories in 2021 relative to 2020. Overall, in the report there are some more detailed discussion. But the PRT noted that there are several factors likely contributing to the levels of harvest, catch and effort, and those factors include year class availability, particularly as the relatively strong 2014 and 2015 fish have been moving out of the Chesapeake Bay and into the ocean.

Also, factors like near-shore availability, angler behavior, and the impacts of COVID-19, which likely impacted each sector and each state differently. Moving on to the management measures. If we're looking at the Addendum VI, 18 percent required reduction, in 2021 we saw a 27 percent reduction in total removals relative to 2017.

This was about the same reduction that we saw last year comparing 2020 to 2017, again, because we had about the same removals in 2020 and 2021. The FMP Review Report includes the state-by-state realized change in recreational removals. Here on the screen here is the change comparing 2021 to 2017. You can also see the predicted reduction based on state conservation equivalency plans.

The PRT noted that again, you know differences in performance from state to state are influenced by a lot of factors, including changes in effort, fish availability and environmental factors. Some states saw increased recreational releases, which contributed to some states having a less than predicted reduction. The PRT also noted that there is a lot of year-to-year variability, even under consistent regulations, again due to things like changes in effort and fish availability.

The report also includes a state-by-state percent changes in commercial harvest. Here on the screen is, comparing by weight 2021 to 2017, and comparing that to the percent change in

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commercial quota implemented through Addendum VI. The report also includes those changes comparing 2020 to 2017 as well. Then moving on to the current recruitment trigger. As of May 2022, the new Amendment 7 recruitment trigger is effective.

For that new trigger, if any of the four juvenile abundance indices used in the stock assessment, so that's New York, New Jersey, Maryland, or Virginia shows an index value that is below 75 percent of all values from the high recruitment period for three consecutive years, then interim F reference points are calculated using the low recruitment assumption. For this year's review of the juvenile abundance indices, we evaluated 2019, 2020, and 2021, and the Maryland JAI for those three years did meet the recruitment trigger criteria, so this trips the recruitment trigger in 2022. Per our new trigger in Amendment 7, this means that this upcoming assessment this year will calculate the fishing mortality reference points using a low recruitment assumption. You can see here the four juvenile abundance indices. The top left, New York, has been above their trigger level for the past two years. New Jersey, the top right, was below its trigger level this past year. On the bottom left you can see Maryland with those three years below the trigger level, and then Virginia was below its trigger level as well this past year.

I'll finish up with the Plan Review Team's comments and recommendations. The PRT noted that in 2021 all states implemented management and monitoring programs consistent with the FMP, with three inconsistencies. The first one, as noted in the past two FMP reviews is New York's recreational regulations state a slot limit of 28 to 35 inches total length.

This does not explicitly indicate whether that upper limit of 35 is inclusive or not. The PRT noted that New York's implementation plan predicted a greater than the required 18 percent reduction, assuming a less than 35 inch upper bound, and the PRT noted that even assuming an inclusive upper bound of 35 that predicted reduction still would have been greater than the required 18 percent.

The PRT noted that the future reduction calculations would just need to recognize this New York regulation as being different than the current standard of less than 35 inches. Second, as noted in last year's FMP Review, Maryland's 2021 summer closure period, which is currently no targeting from July 16 through 31, is different from their approved closure period from their 2020 implementation plan, which was originally August.

Last year at the Board meeting, Maryland stated their intent to continue with this July closure. Then for the circle hook requirement the PRT noted that Pennsylvania implemented the circle hook requirement in the tidal portion of the Delaware River, which is downstream from the Calhoun Street Bridge, but not in the non-tidal waters upstream from that point.

This does align with Pennsylvania's approved implementation plan, which only specified a recommendation for the non-tidal waters, and Pennsylvania noted that the striped bass fishery in the non-tidal portion is very limited, and there are low numbers of fish using that upstream habitat.

Then for the circle hook requirements more generally, the PRT noted that there are differences among the definitions of bait. Some states have more restrictive definitions, and several states have already implemented the incidental catch guidance, which is now a requirement for implementation by 2023. Then finally, there were no requests for de minimis status. Then for PRT recommendations.

The PRT plans to update the striped bass compliance report template to request updated tag accounting information for unused commercial tags. The PRT recommends that Commission staff work with the Law Enforcement Committee and the PRT to follow up with states on any tag accounting questions. The PRT also recommends that the Board task the PRT with a specific review of the commercial tagging program at a regular interval, to review the program components, since it has been about ten years since that program was put into place, to review components like the biological metrics that are used to allocate tags. Then the

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final recommendation is that the PRT recommends the Board consult with the Law Enforcement Committee on what type of enforcement information would be most helpful for states to include in their compliance reports.

Currently the compliance report template asks kind of a general question about enforcement, and the information that we're receiving is pretty widely varied. The PRT is wondering what type of information would be helpful for the Board to see in compliance reports. That's all I have, Mr. Chair, I'm happy to take any questions.

CHAIR GARY: Thank you, Emilie for an excellent presentation, and thank you and the PRT for all the supporting documentation. It was very thorough and it was put together extremely well. Any questions for Emilie from the Board? Oh, we've got one, Chris Batsavage.

MR. CHRIS BATSAVAGE: Thank you, Emilie, for the presentation. On the PRT's recommendation for the Law Enforcement Committee to review the enforcement information in the FMP Review, actually this question might be more for Toni. But would that be something of interest for the Law Enforcement Committee to review for multiple FMP reviews, or are these issues just specific to striped bass? I know it's kind of going beyond this Board, but I know our staff have asked questions about the kind of information regarding enforcement issues to include in compliance reports. I don't know if this might be a cross-cutting thing to look at.

MS. TONI KERNS: Thanks, Emilie. Chris, this is a tough question. We have brought it up with the Law Enforcement Committee before, and there is differing types of data that are collected and kept by a state when it comes to enforcement activities. If we go down to the lowest common denominator, it's not a lot of helpful information. It is a question that I can bring back to the Law Enforcement Committee.

But it may be helpful for either folk to think about, and then send me an e-mail with information that you're looking for, to give me something as a base

to bring to the Law Enforcement Committee, so I have a better idea of how we might be able to tackle it, and see what we can get from the states. It's not going to be something consistent across the board though from every state, due to the lack of what I would say a data base for a lot of these states, in terms of enforcement activity, specific to a species or specific to a certain type of infraction.

CHAIR GARY: Go ahead, Emilie.

MS. FRANKE: Yes, just for some context there. You know some states provided specific numbers of violations. Some states provided a more qualitative overview of the types of violations they were seeing for striped bass. There is just a wide variety of information that we're getting.

CHAIR GARY: John Clark.

MR. JOHN CLARK: Thank you for the presentation, Emilie. I just had a question about the PRT recommendation about the Board task the PRT with a specific review of commercial tagging program at a regular interval. You know since the tag commercial fish are weighed also for quota compliance, was there a specific concern there coming from any one program, or was this just a general?

MS. FRANKE: Yes, so it was more a general observation that there hasn't been a closer look and sort of review of the tagging program since it's been implemented, and just looking at the different biological metrics that are used across the states, and if there are any issues that are arising. Just sort of a more holistic review of the tagging program would be helpful.

CHAIR GARY: Other questions for Emilie? Steve Train.

MR. STEPHEN TRAIN: Is it possible to get the slide up on number of fish caught, number of fish released mortality? I've got a question. Maybe it's been answered, maybe I missed it. But as we change these slot sizes around states, and some states are having closures for a time period, things

like that.

As we change the slot sizes, we saw that especially in the recreational fishery, they kill more fish releasing them than keeping them, that the mortality is higher with the releases. As we change the slot size, are we throwing more fish back and resulting in larger amounts of dead fish, or is that all taken into account when that slot is shifted, based on what we know the average size in that region is?

DR. KATIE DREW: The TC takes that into account when we do these reduction calculations. If you look at the reductions that we're predicting, and the reductions that we realize. You see that we have a bigger reduction in harvest to offset that reduction in releases. The fish that are thrown back, we know that obviously they don't get harvested now, because they're not within that slot, but it's not a 100 percent savings, essentially. Yes, release mortality does go up, but it's offset by that decrease in harvest, so that your overall total removals meet the reduction that you need for the stock. It just gets sort of shifted around into different components.

CHAIR GARY: Go ahead, Steve, you had a follow up?

MR. TRAIN: I'm just trying to figure this. Okay, so the net benefit is a gain, but we're killing more fish released than we were when we were keeping them.

DR. DREW: If you look at the number that you killed before hand, the number that are killed that you harvest and take back with you. The number that you killed by throwing them back add up to make a total removal, and we need to come down from that. When we did these calculations, we needed to take whatever it was, that 18 percent.

When we do the calculations, we figure out okay, here is what the size frequency is probably going to look like. If people can't harvest, they have to throw everything over 35 back.

Then we compare how many did you, so all those 35 instead of being kept are now released alive. You

also release alive all the ones that you would have released alive anyway. The total number of fish that you release alive does go up. But only 9 percent of those are dying. The total number that you're killing, the ones that you throw back and die, plus the ones that you harvest. That total number meets that 18 percent reduction. But if you looked at like your number that you're harvesting, and just compare the 2017 harvest with the 2020 or the 2021 harvest, that is only the ones that you're landing. That is a greater than 18 percent reduction, because we know that some of those fish that we're throwing back are going to die, and count toward the total dead fish.

If we go back to maybe the slide, maybe if Maya can go to Slide 10. We're looking at 5.1 million fish, and you can see that the release mortality is a big component of that. But it's still 5.1 million fish, which is 27 percent less than it was in 2017. We're still getting that reduction; it's just now we've sort of shifted what proportion is in what category.

CHAIR GARY: Go ahead, Steve.

MR. TRAIN: I think you agreed with me. We are killing less fish in total, but we're killing more by throwing them back than we were before we changed the size. We're taking less fish, so we're killing less fish in total. But we know we're killing a larger portion for nothing but fun.

DR. DREW: If you compare it to what we were in 2017, we don't have the 2017 numbers up. But I think it was about, it was 49 percent in 2017 was the release mortality. Now it's at 50 percent, so there is virtually no change here. Like the total numbers of released alive dead fish have actually come down.

But now we're looking at more like 50 percent here, 50 percent of 5.1 is less than. I'm not guaranteeing this. I mean in a sense of like, I don't have the exact numbers, but we've shifted some of that mortality to the released alive fish. But all of those released alive fish that are in the slot, would have been killed, so you're talking about 9 percent of those versus 100 percent of those.

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CHAIR GARY: Tom Fote.

MR. THOMAS P. FOTE: Yes, but I've been looking at Table 3, and the numbers on Table 3 have all the years listed, and it has only the catch. I'm looking at the figures, and what he's saying is true. I mean we're killing more fish from catch and release, and a higher percentage now from catch and release.

What we're regulating is what people can take home to eat, and we're reducing those numbers. But the numbers are increasing, because the catch and release numbers are going up, because they are greater than they were before, and it's a bigger percentage. I'm looking at, because we're looking at numbers like 21 with 1,824,000, and the catch and release numbers was 25 – 2,572,000.

When we go back and look at 2017, they were 29 and 34 – 3.4 to 2.7. I'm looking at a greater increase in the percentage of fish that we're killing from catch and release than we are taking home. We're actually doing a reduction that way, because the numbers steadily have dropped from where we were in 2017, we were at 2,937,000, where in '21 we're at 1,824,000. That is a dramatic drop. If I'm reading the tables right. Am I doing something wrong? I spent a lot of time looking at this table.

CHAIR GARY: You're asking a question, are you interpreting the table correctly?

MR. FOTE: I'm trying to interpret the table the way I'm looking at it. What Steve Train said, it jives with what Steve had stated. I'm not sure whether I understand it. But you're saying that because the releases are now increasing the number of killed fish, while the fish were taken home it's basically reducing it by a greater proportion.

It's really more than 49 percent if we look at the recreational catches. If I'm looking at these numbers when you go 1,824,000 to 2,572,000 that's more than a 49 percent, 50 percent. I don't have my calculator with me, and I'm not going to do that type of math in my head.

DR. DREW: The 49 percent is more for the total.

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Right, so it's for total removals. I was talking about total removals which includes the commercial stuff. I will say, I mean this actually does tie a little bit into our next agenda item, but size and bag limits are really, they are a good tool for reducing harvest, but that release mortality again, the releases are a combination of people who go out to harvest a fish and have to throw things back that are not legal.

But they are also the product of people who go out to fish to catch and release. We can control that harvest, but we need other measures to control the total effort, and that total effort is a big part of that release component. Yes, we've achieved our reductions, but we've achieved that mostly through reducing harvest, as opposed to reducing effort. COVID helped reduce effort, fortunately for us, but that is something going forward to control releases, we really need to be controlling effort with it.

MR. FOTE: Follow up on that, Marty. CHAIR GARY:

Go ahead, Tom.

MR. FOTE: Yes, that means that we basically take on the back of people who want to take home fish. We've reduced their catch, so the guys in catch and release could actually kill more fish. That's it in a nutshell. Now I'm not saying that's how we planned it, but that's exactly what has happened to fall within our quota. It's kind of what I pointed out three years ago. We're not addressing the real problem here; we're just basically restricting what people could take home to eat.

CHAIR GARY: Mike Luisi, did you have your hand up?

MR. MICHAEL LUISI: I did, Mr. Chairman. I wanted to say that you know I'm comfortable with the report that Emilie made, and if you're up for it I can make a motion to approve, if you're ready for that at this time.

CHAIR GARY: Thank you, Mike, and I'll give you first privilege. Just to put it out there one last time. Is there any more Board discussion on the PRTs comments and recommendations? All right, I'll

yield to you for the motion.

MR. LUISI: I move to approve the Atlantic Striped Bass Fishery Management Plan Review and state compliance for the 2021 fishing year.

CHAIR GARY: We have a second by Emerson Hasbrouck. All right, any discussion? **All right then, let's try to do this by consent.** Is there any opposition to the motion? Seeing none, the motion passes unanimously.

PROGRESS UPDATE AND BOARD GUIDANCE ON 2022 STOCK ASSESSMENT UPDATE

CHAIR GARY: All right, we'll go on to Item Number 5 in our Agenda, Progress Update and Board Guidance on 2022 Stock Assessment Update.

We're going to get a Technical Committee Report from Dr. Drew, and look to provide TC guidance, the Board's TC guidance for the management options to consider if the assessment indicates a reduction is needed for rebuilding. We'll also be discussing the timeline for that. Katie, I'll turn it over to you.

DR. DREW: Great, thank you, Mr. Chair. We can just jump right in to the next slide here. I'm going to start by talking about the outline, or basically what I'm going to tell you guys today. I'm going to go over some of our Amendment 7 requirements, in particular the fast-track response to the 2022 update, and the changes in the CE Plans provisions, which impact the assessment itself as well as the management response to the assessment.

I'm going to go over our current assessment update timeline, and then tell you guys what kind of guidance we need, in order to maintain this timeline. Basically, as I'm sure you all recall, Amendment 7 requires a fast-track response to the assessment update. If the 2022 assessment update indicates that one, there is a less than 50 percent chance of rebuilding the stock by 2029, and at least a 5 percent reduction in removals is needed to bring F down to that F rebuild.

Then the Board may adjust measures via Board

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action, i.e., voting on them as opposed to taking them out for public comment via the addendum process. In addition, there were also changes to the CE provisions within the FMP. Commercial and recreational measures from Addendum VI are maintained.

That includes that 18 percent reduction in quota from the Addendum IV quotas, as well as the 1-fish at 28 to less than 35 in the ocean, and the 1-fish at 18 inches minimum size in the Bay. These measures did not change in Amendment 7, and all approved Addendum VI, CE plans are maintained until the measures change.

But going forward, CE programs will not be approved for non-quota managed recreational fisheries when the stock is overfished, with exceptions for the Hudson River, the Delaware River, and the Delaware Bay recreational fisheries. With this new assessment update, I can't say what the results are going to be yet, we haven't seen them.

But we're not going to magically rebuild the stock in the last three years, I hate to break it to you. If we need to take a reduction, this provision will be in place that CE programs will not be approved.

DISCUSS TIMELINE FOR RESPONDING TO THE ASSESSMENT

DR. DREW: Where are we in the assessment update timeline? All of our data has been submitted, and we've been working on runs of the model and projections to answer these rebuilding questions. Next week the TC will have a call to review these preliminary runs and the projections, discuss what we think about these runs, and see if there are any additional runs, et cetera, so that we can have a call to approve the final document in September.

Then look at if we need a reduction, what kind of measures will achieve that reduction, and have those calculations done for the September meeting, so that we can make any changes or adjustments for October, and have the final report, including the assessment update, as well as any proposed

measures, if necessary to the Board October 24, as part of meeting materials.

Then, the week of November 7th will be the Board meeting, where you guys will get this official presentation. In order to maintain that timeline, basically in between now and November, we need to finish the assessment update and come up with potentially management measures for you to consider in November.

If the stock indicates that a 5 percent or greater reduction in removals is needed, the TC will provide the Board with a small, small set of potential options to achieve that reduction, along with the assessment report. You will have the option to approve a set of measures for 2023 at the annual meeting in November, or at a later meeting.

If you guys are ready in November when you see this report, and our beautiful suite of curated options, if necessary, you can approve them in November or we could have a separate standalone webinar in late 2022 or early 2023, or at the winter meeting February of 2023. This is one of the things we need Board guidance on, which is when are you guys going to be ready to make this decision?

Basically, we need you guys to tell us when you will be ready to make this decision now, so that we can plan out the future of this process. Basically, we don't want to hear in November, oh actually we need another board meeting here. That is one of our areas that we need guidance for. The other question is, how do we handle existing CE plans when we start these reduction calculations, and details on the preferred management options for the Bay and the ocean?

I'm going to go into more detail on both of these right now. Currently there are a number of CE plans in place in both the ocean and the Bay. The details on what the actual plans are, are in the TC memo, so you can look at those. But this is basically the ocean, and next slide we can go to the Bay. There are a number of CE plans in place right now.

What do we do with those plans going forward?

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We've already said we won't approve new ones, but what do we do with the existing ones? The TC recommends using the current set of management measures, and the resulting level of 2021 removals as the starting point for calculating the potential reduction of any new measures.

**PROVIDE TC GUIDANCE FOR MANAGEMENT
OPTIONS TO CONSIDER IF THE ASSESSMENT
INDICATES REDUCTION IS NEEDED FOR
REBUILDING**

DR. DREW: Basically, from a technical standpoint, the 2021 removals were the product of the 2021 measures, including all of those CE plans. What the TC recommends doing from a technical standpoint is developing a new set of management measures that would achieve the required reduction relative to 2021, for both the commercial quotas and the recreational quotas, and sort of leave that structure as it is in place, and make changes to the existing structure. That means that some CE measures could be retained under the new regulations. For example, new quotas would be based on the 2021 CE quotas.

Some states are using CE in order to adjust the size limits within their commercial fishery, which adjust the average size of the fish, which adjust your total quota, and some states used CE to take a lower reduction to their quota on the commercial side, and made it up with extra reduction on the recreational side.

If we need to take a reduction, we would take that reduction from the 2021 CE quotas. Essentially, you're leaving that in place and taking a step forward. We could also do things like maintain current seasons if the new regulations only change the size limits or the bag limit. Depending on what the final regulations are, essentially you could be leaving little bits and pieces of these CE plans in place, and just sort of moving on from there.

Alternatively, the Board could require all states to revert to the FMP standard and calculate a reduction from there. The TC does not recommend this, because this would increase the uncertainty in

any of the reduction calculations, since we don't know what removals would have been under the FMP standard, and sort of reverting back to that and then trying to move forward from that is just going to add extra layers of uncertainty.

But that would get rid of all of the sort of extra little bits and pieces of those CE plans that are in place. The final decision on what to do with those existing CE measures belongs to the Board, and this is kind of where we would look to you guys for guidance, in terms of do you want to go with the Technical Committee's recommendation of just start where we are now and tweak it, or do you want to completely clear the board, revert to the FMP standard, and make changes from there?

That is question one. Well, actually I guess at this point we're at question two, what with the timeline and all. I think the plan is we're going to put all these questions back up at the end. But this is question two. The next kind of questions that we're looking at you guys for guidance on is some specifics on the options that we're going to bring back to you in November.

We want to make sure that the options that we bring to you in November are things that you would legitimately consider enacting. We want to bring things that you are interested in, and that you are at least open to hearing about. But we also want to keep these options limited, in order to make sure that we have enough time to complete this work going forward.

Question one, I guess actually 3A, let's say, is how should the reduction be split among the commercial and the recreational sectors? Prior to the last addendum each sector had taken the same percent reduction, so if we needed an 18 percent reduction, we would take that 18 percent reduction on the commercial side and on the recreational side.

With Addendum VI, some states chose to go down a conservation equivalency plan where that split was different. The commercial sector took a smaller cut, and the recreational sector took a larger percent cut, and together they gave you the 18 percent

reduction in total removals overall. We want to know from the Board what options are you considering for this question this time around. Do you want the split to be the same for both sectors? Do you want one sector to take a different percent cut than the other?

That is one question. What recreational measures are you interested in seeing for the ocean and the Bay? I guess this would be more, also you could think of it as what kinds of things do you not want to see. Again, we don't want to bring you back things that you're not interested in. Are you interested in a minimum size limit?

Basically, do you want to get rid of a slot and go to a different minimum size? Do you want to adjust the slot? Are you interested in trying to get seasonal closures to make up some of these reductions? Are there other things that you would like us to look at and bring back to you as options? If you are interested in the seasonal closures, do you want a consistent coastwide closure, or do you want more flexibility for states to pick their own closure dates, say within a particular wave, in order to achieve that overall reduction?

These are the kinds of question we need specifically on the options as we are prepared to develop them if necessary. Again, in conclusion, the Board discussion today has sort of three parts that we need information on. What is the timing for when you will actually vote on these measures, if necessary?

Are you going to be ready to take this vote in November, or do you need more time? Do we need a special webinar? Do we want to have the February meeting be the next time that we vote on this, as well as guidance for us on what are reasonable implementation timelines for a 2023 season, which I think obviously would inform that first question on timing?

Second of all, what do we do with those existing CE measures when we develop the new plans? Do we start from where we are now, or do we revert to the FMP standard, clear the slate completely, and

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build from there? Recognizing that that second option will increase the uncertainty in any reduction calculations.

Then Number 3, guidance on the preferred measures, so that we can bring you back a curated set of options that you are actually interested in looking at further. We don't need consensus on, we want Option A at this point. You know if there is division amongst the Board about things you would like to see, you know definitely we can look at things that don't have 100 percent consensus.

But the key is to bring back a limited number of options that are something you would legitimately consider. That's it. We can leave this slide up to guide the discussion, and if you have any questions, I'm happy to answer them, as well as Emilie can provide guidance on how all this is going to play out from an FMP standard.

CHAIR GARY: All right, thank you, Katie for your presentation. That was a lot of information to process. We're going to be lighting a pretty short fuse, depending on the timing, as Katie mentioned, so we'll start with questions for Katie. We'll go with Bill Hyatt.

MR. WILLIAM HYATT: Just a quick question in regards to conservation equivalency. If the stock assessment indicates that adjustments need to be made, and I think one of the items that you mentioned was that under certain circumstances, existing CE measures could be carried forward. Under that circumstance, do the requirements for conservation equivalency that are in Amendment 7, for example the buffer requirement. Do those get layered on top, even if it's the existing measure being carried forward?

MS. FRANKE: The answer is no. The Amendment 7 provision, not allowing CE, is for any new CE plans resulting from any changes to the measures. The existing components of past CE plans aren't affected by the new provision.

MR. HYATT: Just a follow up. Does that prohibit, however, us taking and making a decision that if

changes are necessary any existing CE should incorporate those changes, or does it prohibit us from that option?

MS. FRANKE: Toni can jump in here if needed, but because the Amendment 7 provision applies to any new CE plans that doesn't affect how this question of where do we start the reduction calculations from? Are we starting from just where we are in 2021, which includes some past CE measures, or are we starting from sort of the blank slate.

You know starting that calculation assuming everyone had implemented the past FMP standard. No, I think the Board can make the choice here of providing guidance to the TC of where to start that reduction from, either that TC recommendation of start from where we are, or revert back and then calculate down.

CHAIR GARY: Dave Sikorski.

MR. DAVID SIKORSKI: I'm uncertain in what I'm even asking here, because it's a lot of uncertainty. I'm thinking back to the Addendum VI measures that my state implemented, and some of the uncertainty in doing those. Those were measures that like short closures were not recommended by the Technical and Law Enforcement advisors at that time because of uncertainty.

If you think about just the technical side of things. We had uncertainty in implementing Addendum VI CE plans. Now we're being asked to potentially carry them forward as our baseline. But being told that to go back to what's in the plan, one at 18 for the Chesapeake Bay that that would be uncertain. I'm trying to balance the two levels of uncertainty. Can you provide any clarity there? I may have a follow up or a question later on here.

DR. DREW: I think the issue is, what's uncertain, we know what happened in the past, and so what's uncertain is what's going to happen in the future. You know we had concerns about, or the TC had concerns about how well you can predict those removals based on a short amount of time, a short seasonal closure.

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Going forward, we know what happened under that plan. We have more certainty in knowing what happened in the past with those measures. Going forward, if you want us to say okay, you would not have had those closures, or you would have done something differently, and trying to predict what would have happened in the past, and then what's going to happen in the future from that? It's essentially adding on two layers of uncertainty. If you say go back to the FMP standard, we need to predict then what would have happened in the past, and what will happen in the future.

Whereas, if you sort of start from where we are right now, we're only predicting what's going to happen in the future. You're sort of only putting on one layer of that. Obviously, you still do have, we always have this uncertainty from year to year of, just because it happened this way in the past doesn't mean that's the way it's going to play out in the future.

You know we see catch goes up and down, even though regulations stay the same. But I think the TCs concern is that you know we're trying to predict what would have happened, as well as what will happen. Why add that extra layer of uncertainty, when we can just start from, well this is what we actually observed?

CHAIR GARY: Okay, I have Jason McNamee and then Dennis Abbott.

DR. JASON McNAMEE: Nice job getting through all of this. That's a lot of stuff. I do have a question. On the first bullet up there, you know thinking about. I would love for there to be some way to have a single iteration not multiple. But to be able to kind of you know, we'll provide some guidance, you guys go sharpen your pencils, create a suite of options, and then an opportunity to see those with still a little time left to make any last-minute modifications.

You can never kind of judge exactly what might come up when you see the options and go from there. That's my kind of lead in to the question is, if we were to delay into early 2023, clearly the intent

is to have. The whole point of this motion was to not delay it, to get some action done for the next possible fishing year.

Does early 2023 allow for that? Is there a mechanism to get, so like for Rhode Island it's possible. Fish don't show up until you know May, so we would have time to get a regulatory process in time. But I wonder, maybe it's a question to other states and not to you guys, now that I think about it. But I wonder if there is any, I think folks should speak up if an early 2023 action would be problematic for them to be able to take action in time for that fishing year.

CHAIR GARY: Go ahead, Emilie.

MS. FRANKE: Yes, thanks, Jay. That is exactly why we're asking this question. There were a couple questions, both at the last board meeting in May, and at the January board meeting of how exactly this fast-tracks response would work. Some folks had mentioned, you know concerned about voting at the November meeting.

When they receive the assessment results, wanting at least a couple weeks to sort of process the options. That is exactly why we're bringing it back, to hear from folks as to when they would be comfortable taking that vote, and what that would mean for how quickly each state could implement new regulations.

CHAIR GARY: Okay, I have Dennis and then Jim Gilmore and Mike Luisi. Go ahead, Dennis.

MR. DENNIS ABBOTT: Thank you, Katie, for the presentation. You're always on top of things way ahead of us. On the first bullet, the first question I have is, are we making the assumption that we're going to need a reduction next year? That seems to be.

DR. DREW: I think we're in a situation of, plan for the worst but hope for the best. The TC has not seen any model results yet, so I think we can't say what we're going to actually see. But I think we also don't want to be just hoping that we don't

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need to do anything, and not have any of this in place. None of this is guaranteed. But again, we want to sort of plan for the worst and be prepared.

MR. ABBOTT: Yes, and I do like that approach. I think that was a requirement of Amendment 7, to make us do this. I'm all in favor of whatever we have to do that we do it to be implemented in the 2023 season, as we've committed ourselves to do whatever that may be. That is my question and my comment on the matter.

CHAIR GARY: Thank you, Dennis, and one correction to the queue. John, I think you were up next, and then we'll go to Jim, and then Mike Luisi.

MR. CLARK: I was just going to respond when Jay asked about an early 2023 decision being made that I know our season starts in February, so yeah that would be really difficult to change things from a regulation standpoint. I mean even November would be pretty aggressive, to get some of these things done. I'm sure other states with early seasons might be facing the same difficulties.

CHAIR GARY: Jim.

MR. JAMES J. GILMORE: Just a suggestion. First off, if this works out, remember in terms that we have the November meeting, which is the beginning of November, and then we have the joint meeting with the Commission the second week of December, and it's becoming a regular occurrence now.

Where we used to have only one a year, now we have like four or five. We could possibly add on a striped bass thing to that meeting, which is in Annapolis, so I don't know if that helps us or not. But at least we're not to the end of the year, we're in the middle of November at that point. Mike, you would love to host another ASMFC joint meeting too, right?

MR. LUISI: We can have every Striped Bass meeting from here on out in Annapolis if you would like.

MR. GILMORE: Again, so we back to our plug. Even

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if it was delayed until February, New York could get its rules in place. But that scares the hell out of me, because if we get there and we're suddenly down the rabbit's hole, and we don't have a lot of answers, then we're all going to be in a lot of trouble. I think either if we can't get it resolved by that November meeting, we've got that other Council meeting in December that we might be able to piggyback on. I'm not even going to touch CE, because that one, Katie, you said it really good, and I think you're in New York. The speed you went through that. That was pretty impressive. You're an honorary New Yorker now, in terms of talking fast. Just on the sector split though, the question I had. It really comes down to two. It was either going to be a 50/50 or it was based upon the recreational versus commercial, if you went 85/15, so it would only be two options at that point.

Then you would calculate size limit, seasons, essentially based upon those two options, or does it get to be you put more options in there, is it linear any longer? It's like rhythmic, in terms of the amount of work you have to do. How much work does adding a third option in actually going to cost you guys.

DR. DREW: It depends on what kind of an option you're talking about. Obviously, if you want different splits for a commercial versus recreational, or different reductions for each sector, then we basically start multiplying out from there, because we'll need the recreational options. You know if you want to add an extra size limit that is just one extra option.

If you want to add an extra percent split that is two extra options you have to add on top. You start having to multiply that through, because then you need the different size limits for the ocean and the Bay under one split, the different size limits for the other, et cetera. Yes, it depends on basically choosing different splits or different sector reductions is a multiplicative effect. Adding an extra size limit consideration is more of an additive process.

CHAIR GARY: All right, next we'll go to Mike Luisi,

and then we have Nichola Meserve.

MR. LUISI: I'm trying to figure out what we're actually going to see in November. The way I'm thinking it through, the suggestions we make today on guidance to the Technical Committee will produce something that we'll have a first look at based on the updated assessment information that is used in calculating whatever it is we're looking at in November.

I would agree with Jim that I think there are two possible ways to get to a reduction if it's needed, if it's the worst-case scenario that we're planning for. One would be an equal sector split so the reduction is taken equally, and the other is the one that was presented where it's like an 85/15 based on the proportion of removals.

What I envision seeing in November is not just one selected result of the guidance that we're giving. We may have two or three different views at ocean and Chesapeake Bay, and maybe within some of the other systems, options to consider for implementation in 2023. To the first point.

If that is accurate as to what we're going to be looking at for the first time, I would have a very difficult time supporting making a decision at that November meeting as to what we're going to implement, without spending some time, taking what we get that is supported and approved by the Board out to the public.

Even if it's a state-run hearing a couple weeks after the board meeting so we can generate some public feedback and comment in making our final decision, sometime either right before the turn of the year, or early into the next year. I would be very uncomfortable going into November thinking I'm going to have to decide on what option I'm going to select, having seen it for the first time and not having had an opportunity to talk to any of my stakeholders in Maryland.

I'll stop there, Mr. Chairman, I do have comments as we go through the questions, so hopefully I'll have a second chance to provide those thoughts.

CHAIR GARY: We're going to go with two more, and then I'm going to bring the Board back to the timing issues, and we'll go through those sequentially. Max, I'll let you, so we'll have three, Max will be last-say. We're going to bring it back to each of these incrementally. We'll start with the timing. I do want to hear from the public as well, both in-person and online. You'll have an opportunity, some limited comment. We'll go to Nichola first.

MS. NICHOLA MESERVE: Even for a state that has a later season start than many others, I think a February decision point is problematic from an implementation rulemaking process and getting the word out to stakeholders. November would be ideal, but I do agree with Mike about a need to provide a little bit of time for states to get some input on measures that we may see for the first time in November.

My viewpoint would be to hopefully plan on a December meeting as Jim suggested, for decision making at that point. Even that timeline I think hinges on the guidance that we give to the Technical Committee today, and being pretty narrow in the range of options that we're requesting.

To I guess, begin to delve into that discussion a little bit, you know I would be looking for equal cuts between the two sectors and a limited range of options, commercial quota cuts and on the recreational side looking at the size limits. I think seasons is a much thornier issue to get done quickly.

Then kind of our standard measures, something that is already in the FMP with minimum sizes and maximum sizes, and just looking at perhaps narrowing the spot on the coast, perhaps implementing a slot in the Bay, those types of measures that the Technical Committee can likely turnaround more quickly and with less initial thorns in them than looking at something like seasons.

CHAIR GARY: Emerson.

MR. EMERSON C. HASBROUCK: I agree with what

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Mike said a few minutes ago on timing. I also think that timing in our decision in reaction to the assessment, is going to be based on what the reduction is going to be. If after the assessment we see that it's a relatively minor reduction, we can probably make that decision a little bit quicker and easier than if it's a larger reduction that has to be taken. I think we need to leave ourselves the opportunity there to have more time if there is a larger reduction.

CHAIR GARY: Max, you have the last word before we move on to timing.

MR. MAX APPELMAN: I appreciate that. Thank you. I was going down the same line of thinking as Dave Sikorski over there with uncertainty, and was trying to reconcile all the information that I'm hearing. With the CE measures, you know if the intent of Amendment 7 is to not allow CE moving forward, while we're still in an overfished scenario.

But the TC is also saying we need to sort of grandfather in these CE programs, or else we're adding uncertainty. I'm just wondering how the Board can get out and clear the slate without having to deal with all this uncertainty. Is there a way for the Board to do that or is this just, you know at some point we're going to have to accept what we decided and accept that uncertainty at some point. Anything to just help me understand that a little bit better?

MS. FRANKE: Yes, I'll just start off there. I think, you know as Katie mentioned from a technical standpoint. Starting where we are, you know those 2021 measures, no matter if they were the result of CE or not, is what resulted in the 2021 removals. That is just kind of where we are in terms of what led to the level of removals we saw, and what we're basing that percent reduction calculation off of.

I think what you're saying is, you know the Board is having to reconcile with, how do we move forward from what was implemented through Addendum VI CE? And, this is a question to the Board as we have all of these CE programs in place. It's now the time, if we're thinking about a potential reduction, the

Board is having to address what happened with the last management action when trying to figure out how to move forward.

DR. DREW: Yes, I don't think there is anything technically we can do about it. I think it's more like when and where is the Board willing to accept some uncertainty going forward, in order to get to clear the slate or get back to where you want to go. You'll have to accept some degree of uncertainty in that if that is what you want.

CHAIR GARY: Does that help, Max? Good, okay. All right, what I would like to do now is go to the public for some comment on the timing component, and if we could do a show of hands for the public that's here in Arlington in the room, and also a show of hands. I think there is a hand raise feature.

Emilie is indicating yes, so those of you that are listening online, raise your hands if you would like to comment. Let's see what kind of feedback we get and we'll determine the time allotment. We have one hand here in person and two on the webinar. Let's see if we can do this in five minutes, so Mike, do you want to come up first? A minute or two, Mike, if you can.

MR. MIKE WAINE: Thank you, Mr. Chairman, Mike Waine with the American Sport Fishing Association. Are you just looking for comments on the timing, or can I comment on some of the other topics discussed by the Board?

CHAIR GARY: We would like to do the timing if possible. Yes, go ahead.

MR. WAINE: Are we going to get another shot at the other topics?

CHAIR GARY: Yes.

MR. WAINE: Okay, well for the timing I think the Plan Amendment 7 is pretty clear that the Board has to act quickly. I guess if that is the Board needs a little bit more time administratively, as long as the implementation stays 2023, I think that is to the Board's purview. But I think the Plan is pretty clear

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that the Action needs to happen quickly if the assessment says something needs to be done. Thanks.

CHAIR GARY: Thank you, Mike, and so who do we have online? All right, Dale Kirkendall. Captain Kirkendall. A minute or two if you could, please.

MS. FRANKE: Dale, if you're speaking, we can't hear you. We'll come back to you in a moment.

CHAIR GARY: All right, Patrick Paquette, you have the floor.

MS. KERNS: Patrick, you need to unmute yourself.

MR. PATRICK PAQUETTE: I believe I am unmuted now. Thank you, Patrick Paquette, Massachusetts Striped Bass Association. Specific to the timing, I believe that a large number of the public here in Massachusetts would prefer a decision made closer to the scenarios that were described regarding special meetings prior to the end of the year, as opposed to February.

I would just give for some reasoning for that. I would ask you to remember that February is the middle of what I will call sportsmen show season, when charter captains and the public are both booking charters and selling charters for the upcoming season. I live on Cape Cod. Striped bass is a major tourism draw, and striped bass charters are a major tourism draw.

It would be much more convenient to the public, although I believe the public absolutely supports getting this done this year as opposed to next. It would be regulations that come out in February for this fishery for the immediate upcoming season, would be made much easier if they came out just a few months before, and it would make the industry and the general members of the public trying to book with the industry. It would put them in a much better place.

CHAIR GARY: Thank you, Patrick, we're going to go back to Captain Kirkendall, if you are able to unmute yourself.

MS. FRANKE: Dale, it looks like we still can't hear you. We'll try to come back to you perhaps later in the meeting. But otherwise, I can follow up with you after the meeting.

CHAIR GARY: All right, thank you. We're going to bring this back to the Board. I would like to conclude our feedback for general guidance to the TC on timing. You've already had significant input, so we'll come back. Ritchie.

MR. G. RITCHIE WHITE: I think we pretty clearly told the public that we were going to act in November, when we passed this. The purpose was to act in November, and we asked all the states, if we do that can you implement for 2023? The answer was yes. We've already told the public what the intent is, and I think we must do this in November. Therefore, I think with that. If we decide that first then the rest, we have to back into it. Then we can't have options that are so complicated that we can't make the decision in November. That is the way I would look at this process.

CHAIR GARY: I know Mike had his hand up, but I'm looking for folks that haven't commented. Justin, we'll go to you and then over to Tom, and then to Mike.

DR. JUSTIN DAVIS: From my standpoint, I think I've been pretty clear about this on the record every time we've had this discussion. I was only comfortable with this new approach that we adopted in Amendment 7 of allowing Board action, if there was going to be enough time between when the Board received the candidate set of regulation options and when we had to make the decision, such that states had a time to do their own state-specific abbreviated, but state-specific outreach.

In good conscience I can't sit here and say that I would look at a set of options one week and make a decision the next week at a meeting about what we would be willing to adopt in Connecticut. From my standpoint, I'm liking the consensus that I think is emerging here around doing a meeting in December to take action, which to me doesn't at all

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I think jeopardize 2023 implementation.

CHAIR GARY: Tom Fote, and then Mike Luisi.

MR. FOTE: Yes, I agree with Justin, just the same, we have a problem. I mean we have a fishery now in January that we never had before, and into February people are still fishing, because the water is still warm so it's going right through the season. Party and charter boats are still going out fishing for striped bass in January. I'm not, because I'm in Hawaii then.

But anyway, that is what is going on. The other problem I have here, because I'm not sure what the public wants us to do at that point with the information we get. One of the concerns I have, and I don't know if Katie, we have a bunch of catch and release studies on warm water, on how you basically handle fish and things like that.

I don't remember, and I'm wondering if in our files we have a catch and release study on older fish versus younger fish. Now I know, because I've done a lot of striped bass fishing over the years. When you're basically bring in young fish, because you're fishing with heavy tackle now, you don't want to stress anybody out. You get them in right away and you release them, they just go swimming off.

When you get the big females and they come in there, 41 inches, 51 inches or 52 inches, which has been a lot of fish this year. You've got to spend a lot of time reviving them, and they move away very slowly. If we shorten the size limit again and we don't raise it up, say go from 28 inches to a 30 inch, and make the size limit that. We're going to begin targeting bigger fish to basically get back to catch and release, if you start narrowing the slot even more than 35 inches. You're basically going to kill more fish. Again, with catch and release, because that is what you're doing. I don't know what the answer is, but I just have that question. Are there any studies that basically tell us what happens, so I can help my decision-making process?

CHAIR GARY: All right, thanks Tom. We're going to go to Mike, and then I would like to kind of wrap

this up if somebody else hasn't spoken we'll entertain that. Otherwise, we're going to try to see if we can get some consensus here, and I think Dr. Davis indicated that is at least what I'm hearing and what my notes reflect. But hopefully we'll find out. Mike, you may or may not have the last word. Go ahead.

MR. LUISI: I'll be really quick. I just want to remind the public that the traditional way that we would handle this type of action would be to hear the assessment results in November, and depending on whether or not we agreed with those results, we may or may not initiate an addendum, which would start a process that could take up to a half a year or longer to put new management actions in place, which would take us to 2024 at the earliest.

Now this Board made every attempt during the Amendment 7 discussions to make the appropriate decisions and comments on the record that we feel that we need to take action more quickly than that. This concession that we're making here to speed up the train, I still believe we are going to meet those expectations of the public to have measures in place early in 2023.

But there is a public process that I still feel very strongly that I certainly need some time with my stakeholders, as Justin mentioned, before I make a final decision on measures. I just want the public to be aware that it's not that we're moving any more slowly than we normally would. This could take a very long time, but we're making the attempts in the manner that we're discussing today to get this done very quickly.

CHAIR GARY: Nichola.

MS. MESERVE: I just wanted to double check that the timeline, I think Katie presented it earlier. But it doesn't allow for the stock assessment results, the projections and options, provided we give guidance today, to be provided, you know a month before the annual meeting, such that states could kind of front load public input before the annual meeting. What is the soonest all of that could be ready?

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DR. DREW: I think it depends a little bit on the results and how much additional work we would need. We do intend to present the results to the TC next week. Then depending on how much feedback there is from the TC about, is this the right base run, do we need to see additional sensitivity runs?

Are there concerns with some of the data, et cetera? That could propagate through, and similarly with the calculating any necessary reductions, how much back and forth does the TC need amongst itself to get some of this stuff done? We sort of planned it out so that we would have it to you guys no later than those two weeks ahead of time.

But there is the potential for, if things go well and we don't have a lot of technical back and forth on these issues, we could compress that timeline and release it sooner than Board materials. If that is something the Board is very interested in, I think we could look at compressing that timeline. But I also don't want to offer that up as something that we can definitely do, if it turns out there is more complicated technical questions with how the assessment and the projections play out.

CHAIR GARY: Justin.

DR. DAVIS: I appreciate the second opportunity. I think I would like to return back to, I think a question or a comment Jason McNamee brought out earlier. Is there any state around the table that feels like if we made a decision in December that that would pose a real problem for implementing rules ahead of the 2023 fishing season?

CHAIR GARY: It's a good question. Anybody have an issue with that? You've got your answer, Justin. We'll go ahead and bring this back now. Are there any Commissioners that haven't had a chance to weigh in that would like to, if you haven't spoken? I think we're ready. My notes indicate, and it looks like it's pretty clear.

There has been a coalescing around having a meeting sometime in December. Emilie and Katie, does that match up with what you all are seeing in

your assimilation of feedback? We're looking for guidance through consent, without a motion if possible. I'll go ahead and reach out to the Board. Is there any objection to going ahead with the idea of a December meeting for our timing? No objection to that? Go ahead, Eric.

MR. ERIC REID: Is this going to be a standalone meeting, or is it going to be essentially a standalone meeting in conjunction with the Mid-Atlantic Council, because it would be a Striped Bass only meeting, so it's a standalone meeting in conjunction with the Mid-Atlantic? I'm getting noes over there, so I just want some clarification on what we're thinking about this.

CHAIR GARY: Thanks, Eric, I'll go to Toni.

MS. KERNS: I think we would have a virtual meeting. We would poll the states, well the Board to see what day works best for the Board. My guess is that it will have to be outside of the two Council meetings that occur. New England is the first week in December, and the Mid-Atlantic Council is usually the second week in December, so likely it would be sometime in the third week, unless we did it on a Friday or a Monday. But it would be virtual.

CHAIR GARY: Go ahead, Emerson.

MR. HASBROUCK: I had a question for the TC. Can we put that calendar back up again? It was just up a couple minutes ago? I'm guessing then that the week of September 19th the final assessment report is going to be available. Is that correct?

DR. DREW: That's the assessment goes to the TC and the TC, so basically in August 10, the TC may or may not ask for additional runs, additional things like that. We would do those; we would put that in the report. Then the TC is going to see the report. There is the possibility that the TC is going to want to make adjustments to the report on the basis of whatever came out of those additional runs, or however it is. In theory, yes, we would love it to be like check we're done. But we always do build in a little extra time, in case people have concerns about the results or the way they are presented in the

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assessment report.

MR. HASBROUCK: Okay, thank you for that. Then on the week of October 10, a TC call to approve final proposed measures if necessary. Is that where the TC is going to review whatever guidance we give you today against the results of the assessment? Is that what's going to happen that week?

DR. DREW: Essentially, basically we will come to that September 19 meeting with projections that they either everything is great, we don't need a reduction, or our base run says we need a 5 plus percent reduction. In which case, we'll need to set, the TC will assign people to work on what kind of measures will get you that reduction for the ocean, what kind of measures will get you that reduction for the Bay.

We need to know what the approved base run of the model is, which is that September 17, in order to then know what percent reduction we need to take. The TC will run all the measures and figure out what will get you to that listening to the guidance of the Board.

MR. HASBROUCK: Thanks. That is what I thought the timeline was going to be, and the steps. What I'm wondering here is, will that assessment be shared with the Board before you go through the activities of the week of October 10? If the answer is yes, great. If the answer is no, I would ask that you share the assessment with the Board, so we have some sense of where we're going with this as soon as possible.

CHAIR GARY: Last call for any feedback. I think staff is agreeing that they've got the feedback that they need, and we have the consent for a December meeting. Is there any resolution? I know we have the Council meeting, I guess in December. We'll try to work around that.

But, any other thoughts about when that might occur, or is not that important to drill down to specifics?

MS. KERNS: Like I said before, Marty, it would

either be sometime the third week in December, or we'll put in the doodle poll the Mondays and Fridays of the Council meetings, knowing that the Councils typically do not meet on those days. If they extend their meetings for some reason, we will avoid those.

CHAIR GARY: Thanks, Toni. All right, Jim, you have the last word.

MR. GILMORE: Just quick. The only reason I suggested tagging it on is because that following week is Christmas week. You know trying to do a meeting Christmas week is going to be a nightmare. If we could tag it onto the Council week would be, I think ideal.

CHAIR GARY: Emilie and Katie, we have what we need on timing, right? All right, so I would like to next go to the other two items and bundle those two together. This is how to handle existing Addendum VI conservation equivalency measures when developing new options. Remember the two choices were to use the TC recommendation, use 21 measures as a starting point, or use the FMP standard as a starting point. Then we're going to bundle that also in this discussion with the other option, which is preferred management options to achieve the new reduction. For instance, looking at things like sector split, size limit changes, season changes in the Chesapeake and coastal options.

What I would like to do is go to the public first, because we had a little bit of discussion already at the Board level on this, and get again a show of hands both in the room here in Arlington, and online, as to who would like to comment. Go ahead and raise your hand online, and I see Mike you want to comment. We have one person here in Arlington that would like to comment, and we have two online. Mike, go ahead and take the podium.

MR. WAINE: Thank you, Mr. Chairman. Mike Waine, with American Sport Fishing Association. I'm trying to kind of understand how the Board is going to navigate this with some of those preferred management options listed on the slide. The reason I say that is, I'll just take the sector split one

for example.

To my knowledge that is part of one of the conservation-equivalency plans from one of the states. What I'm trying to reconcile here is, it was clear in Amendment 7 that the Board needs to act quickly to address a mortality issue if there is one from the assessment. But I think there was some understanding by the public that you would likely use management measures that you've used in previous plans, or technically in Amendment 7 right now, which was both Bay wide and coastwide measures as the baseline.

You know I think that it is somewhat of a disservice to use some of these less used CE specific regulations as a coastwide or Bay wide management response if you're going to act quickly. If you were to do that, use some of those CE proposal regs, I think you should do that through a longer public comment process in a management document, personally.

To just kind of summarize my input here. I think the goals and objectives of the FMP were to bring some uniformity to the regulations. The data suggests that when you use it across a broader geographic region it is more reliable. My suggestion would be to use Bay wide and coastwide measures as part of the management response. That would be essentially bag and size limits for the recreational sector. I guess my time is up.

CHAIR GARY: Go ahead, Mike, I'll give you another minute.

MR. WAINE: The other thing that I wanted to address was this decision to take the reduction between the recreational sector and the commercial sector. I'll just remind everybody that this was discussed in Addendum VI at the New Hampshire annual meeting in 2019. Specifically, this was a question, should the reductions be taken equally between the sectors. There was a vote on that. The ultimate decision was to do equal reductions.

There were some states that used conservation

equivalency to not follow the decision of the Board.

I guess seeing the presentation this morning from Emilie with an FMP review, and seeing that that commercial quota is being more utilized in recent years. I think it's reasonable to not revisit the decision about equal percent reductions. Leave it at equal percent reductions, and take that as a way forward right now. I appreciate the extra time, Mr. Chairman.

CHAIR GARY: Thank you, Mike, so we're going to go online now and we only have two other commenters from the public, so approximately I'll give you three minutes. It's Ross Squire, you'll go first. Ross, if you could unmute yourself.

MR. ROSS SQUIRE: All right, can you hear me? MS.

FRANKE: Yes, we can.

MR. SQUIRE: Okay, great, thanks. My name is Ross Squire. I'm with the New York Coalition for Recreational Fishing, and my comment is in regard to going with either the existing CE options or considering new management measures. I'm wondering if a third option should be added, and that is to only consider continuing CE measures if they are meeting or coming close to meeting the goals and reductions that they were intended.

I don't know if the Board has been provided with that information, but it seems inconsistent that the Board would approve CE measures going forward, if they've shown that they haven't met the original objective that they were supposed to. I think back on earlier addendums where CE proposals were approved by the Technical Committee, and they grossly underperformed. It just seems inconsistent that the Board would permit that to happen going forward. Thank you for allowing me to speak.

CHAIR GARY: All right, Ross, I appreciate your comments. Next, we'll go to Dale Kirkendall. Dale, I'm hoping you've solved your mute on the microphone.

MR. DALE KIRKENDALL: I am too. Yes, I had to

switch devices. The last comments made by the fellow from New York on the recreational side. That makes sense to me. When we have conservation equivalency in place that demonstrates that it is meeting the objective, I think it should remain, especially if it reduces the uncertainty of going back to the original FMP plan to make the reductions.

Additionally, I do have an issue with the CE not being able to use it to distribute within a state. I believe each state has the right to whatever number of fish the Atlantic States Marine Fisheries is giving them to catch. However, they want to catch them and preserve them, they should have that right. If New Jersey wants to use its commercial fish as recreational fish, or if a state wants to split their fish differently between their commercial and recreational sectors, they should be allowed to use CE as a states' rights issue to come to that conclusion.

The Board, I understand they have some penalty process in place, but I'm not sure that that is legal, number one, to have that when it is the fish within the state and how they are being split. Additionally, I didn't get to comment on the timing thing. But in Maryland we are issued our tags prior to the upcoming season for commercial fishing. That starts in January 1. I'm not sure with a December timeline that we could be issued the appropriate number of tags if there were reductions or not, or how it would be managed as they're returning tags and such, so that we get the right number. As well as, the commercial fishermen have a card that is issued to them just prior to the season, there is no way that that window can be completed, if we're not making decisions until December, and unlikely it could be completed if we were making a decision in November. The fishermen of course, they want to fish when the fish are there, which is likely the first week or two of January for our gillnet season. Those are my comments.

CHAIR GARY: Thank you, Dale, I appreciate that. All right, we'll bring the conversation, the discussion back to the Board, and we'll go ahead and tackle these one at a time. We had a bundle from the public, comments. Katie.

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DR. DREW: I think just to clarify. I think on the existing CE measures or CE plans, we would not be retaining an entire plan from a state. It would be more like there would be certain measures in place that if the final options didn't affect them, they would stay in place. For example, in the Bay.

The Bay used seasonal closures in some places to get to that reduction. If for this Board action the Bay put in, for example let's say a slot limit, and that slot limit got you the reduction with the existing seasonal closures they wouldn't have to change those seasonal closures in the approach that the TC is proposing.

The other option would be to take those closures away, and go back to whatever seasons were in place before that CE plan, and then put new measure in. We're not proposing that we keep entire plans, we are saying that it would be easier to keep sort of the little leftover bits of CE that are not affected by the final measures that the Board approved.

That includes for example on the commercial side, several states took a smaller reduction in quota, and offset it with a change on the recreational side. If we got rid of those CE plans, they would have to take that full 18 percent cut to their quota that was specified by Addendum VI, and then what do you do?

They've taken an 18 percent reduction on that side, do they get to go back up in order to balance it out, if we don't need a full 18 percent reduction? That is kind of like what we're talking about with these little leftover bits of CE, or just wipe the board clean and then go back? We're not talking about keeping full existing CE plans, it's just little leftover regulations.

CHAIR GARY: John, did you have a question about that?

MR. CLARK: Yes, I'm just a little confused there, Katie. We're one of the states that did that. You're saying that even if we, and I'm strongly in favor of keeping the CE measure, just working off of that.

But you're saying that if we did that our sector split that resulted in, if there is a different sector split that is voted on by the Board, then we would have to change pretty much everything?

DR. DREW: No. That would be if the Board decides on a different sector split, then we would take that so under the TCs approach, you know you would take it from whatever your quota is now, and then you would just take the whatever split you need, whatever split the Board decides on, and whatever reduction you need from what your quota is now. The other approach, which is to wipe the slate clean, means we have to go back and take away those CE adjustments to the commercial quota, and basically go back to the FMP standard of everybody takes the same cut, and that is that 18 percent from the commercial and the 18 percent from the recreational, if you wipe the slate clean of the CE.

MR. CLARK: Do not want to do that. Thank you.

CHAIR GARY: If it's all right, we have a ton of hands that are going up, but could we go ahead and tackle these one at a time and try to achieve consent from the Board to give guidance to Katie to take back to the TC. We're now going to try to focus on how to handle the existing Addendum VI conservation equivalency measures. If everybody could focus on that. Jason. Let's see, let's queue this up. Jason, Megan, Emerson.

DR. McNAMEE: I think I'm going to be brief here. I'm in complete agreement with the Technical Committee, I think that's who said it, who recommended it. It would be, I think, extremely difficult. I guess you would have to perform a bunch of simulations or something to reinvent what might have been.

It makes perfect sense to me that the baseline is 2021 or whatever year we're talking about, it was 2021. I'm in complete agreement with their recommendation from the Technical Committee, and think we would be injecting a bunch of unnecessary uncertainty as was discussed earlier, if we did anything different.

CHAIR GARY: Megan.

MS. MEGAN WARE: You just want the second bullet, comments on that? Okay, I'll agree. I think the TC has strong rationale for using the existing measures as the basis for the 2021 removals. As Katie has explained it, my understanding is that means there may be some elements of CE proposals that move forward into whatever our next set of regulations are, but that the measures that are changed, those will be uniform in whatever region we're talking about.

I'll go back to our discussion on Amendment 7. I think the underlying reason that the Board voted not to have CE when the stock is overfished is there was concern that the disparate measures are undermining our ability to rebuild the stock. I think this gets at kind of an aligning of measures down the road here, so that as we're making changes, we start to see greater alignment of measures between states.

I think that is achieving one of the goals that we heard from the public out of Amendment 7. I do want to be clear though what I'm not comfortable with is a situation in which each state, I'll make up numbers here. Let's say it's a 10 percent reduction we need. Each state gets a 10 percent reduction, and kind of has the freedom to make up its own package of measures. To me that is CE, so that is something I would not be comfortable with.

CHAIR GARY: We're going to go to Emerson Hasbrouck, Dave Sikorski, and Justin Davis.

MR. HASBROUCK: Jason said exactly what I was going to say, so I have nothing further to add. When I was leaning forward with my hand up, I blocked Joe, who also had his hand up. I'll yield my time to my colleague from New Jersey.

CHAIR GARY: Go ahead, Joe, take advantage of that.

MR. JOE CIMINO: I will, thanks, Mr. Chair. I agree with Jay also that I don't see how the TC would even come up with a different option. But it was

something that Emilie said that concerns me, and it makes me feel like striped bass is once again moving towards our black sea bass management.

That is the assumption that we're going to have to make, all of us, that the measures that were put in place are the reason why the harvest estimates were what they were. As if we had those same measures in place in a different year, and we wouldn't see incredibly different harvest estimates. I just want everyone to keep that in mind as we move forward.

CHAIR GARY: Go ahead, Dave.

MR. SIKORSKI: I appreciate all this conversation around the uncertainty in the CE measures, and I think Megan just hit the nail on the head. I agree with what she just stated. We're trying to align consistency amongst our regulations that hit the water for the recreational sector or for commercial is different of course. But I think that consistency is key.

That is why, not only did this Board decide in Addendum VI that reductions should be equal, even though they weren't in many states. Back in Amendment 7 there is consistent measures for coast and for Bay, and I think that is key moving forward. Without that we're ignoring the public, and the desire to find some more consistency. When we're on the third bullet point, I would like to offer one concept in regard to that down the road. But thank you, I agree with Megan.

CHAIR GARY: Justin.

DR. DAVIS: Quickly, I'll just echo the comments around the table that I think the only workable solution is to use 2021 as the baseline going forward to develop new measures. To put a finer point on the discussion about how interjurisdictional inconsistencies in measures that were brought about through CE could potentially perpetuate forward here.

For the ocean fishery, the only way we could have an inconsistent length limit as a result of this

process would be, is if we chose to achieve reductions only through season. As soon as we decide that we're going to use length limits as a tool for achieving reductions on the ocean fishery that means we're going to have a consistent length limit for all states in the ocean fishery, correct?

DR. DREW: Yes, that would be unless the Board decided to go some other kind of regional approach or what have you. Once we decide on a length limit for the ocean, and we do not permit conservation equivalency for the ocean, then that is it you're set.
CHAIR GARY: John.

MR. CLARK: Just to clarify this. I'm sorry I'm just not really grasping exactly what you're getting at here. Take a state, using a concrete example of Delaware, where we have a slot season on resident fish in the summertime. We've taken two reductions on that already in Addendum IV and Addendum VI. Under Addendum VI, we partitioned the cutback between the recreational and the commercial. We gave commercial only about a 2 percent cut.

As the results show, we've hit the marks perfectly both years, we've exceeded them in the past year. I'm just still not grasping exactly what you're saying here now. Whatever the cut is, we're going to keep the slot season on resident fish in July and August in Delaware, and the commercial side though, depending on what that works out to, will that let us know how much we need to reduce the commercial side, or how will this work?

DR. DREW: The Delaware Bay is one of the special cases for CE, where CE is still permitted under Amendment 7. In order to accommodate those smaller, resident fish, similar to the way the Bay is explicitly accommodated. I think if the Board decides to revert to the FMP standard, which is seems like the Board is not going that direction.

But if the Board were to do that what would happen is all of those CE plans would be wiped out, everybody's quota would go to the 18 percent reduction from Addendum IV, and then that would be our starting point. I think it's extremely unclear

how you would adjust that quota if you needed to take a reduction from there, when you've already taken an 18 percent reduction.

But in theory, everybody would take the 18 percent reduction from Addendum IV, and then that 5 percent, 10 percent, whatever reduction would be applied to the commercial quota and to the recreational fishery, with whatever set of measures for the ocean, and just the reduction on the commercial side.

Because the Delaware Bay is explicitly exempted under Amendment 7, as is the Hudson River and the Delaware River in Pennsylvania. You could then do a CE plan for that specific region to achieve the same measures. But it would not affect ocean measures. If the Board were to go with the TCs recommendation, everybody would keep their commercial quotas as they are now.

Everybody would adjust the ocean measures to match whatever option gives you the necessary reduction. Then Delaware Bay and Hudson River and the Delaware River would be permitted to provide conservation equivalency plans to make that same reduction, if that is the will of the Board.

MR. CLARK: Thanks, okay, so it is more of what we have now going forward if we continue with CE.

DR. DREW: Yes, it's more like we're going to start from what we have now, and adjust it as opposed to trying to roll back and go in a different direction.

CHAIR GARY: Thank you, John, thank you, Katie. If I could be so bold, I think what we're hearing, and staff concurs, we have it highlighted. I seek to find if there is any objection to the TC recommendation.

Hearing none, then that is what we'll go with. All right, so we're ready to move on to the last piece of this puzzle, not the last part of the agenda but the last piece of this puzzle.

This is the preferred management options to achieve the new reduction, which include options like sector split, size limit changes, season changes

and the ocean and Chesapeake Bay specific options. We'll open this up to discussion, and hopefully we can form a consensus on this. We'll go ahead, I've got Justin, Mike, and Megan. Let's start there. Go ahead, Justin.

DR. DAVIS: I think I would like to invite a conversation for states around the table about the potential size limits to look at for the ocean fishery, and whether there is any interest around the table in taking a minimum size limit off the board at this point. I've been a big proponent of the slot limit from the start.

I think there is really good reasons to believe that is a great regulation and a great management approach for striped bass. I've heard nothing but support really from stakeholders in our state, including from the for-hire fishery that were really reticent about it at first, but now feel like for a couple years here they've really been able to talk to their customers about the benefits of releasing these older, larger fish.

I just think it's a regulation that is working well, and I also view that regulation as a long-term investment. We've had it in place for a few years. We're starting to get some size classes through that slot and into the protected portion of the regulation. I just think it will be a poor choice at this point, a few years into it, to reverse course and adopt a minimum size limit, and go back to that and sort of expose those year classes we just got through the slot to exploitation again.

You know in the interest of potentially saving the Technical Committee some work, if there is consensus around the table that we should stick with the slot limit. I would just throw that out there that maybe that is a decision we can make today that we don't want to take a look at minimum size options for the ocean fishery.

CHAIR GARY: Next we'll go to Mike Luisi, then Megan, then Dave Sikorski.

MR. LUISI: I'm going to defer my comment on the question that Justin asked to Dave Sikorski. But I

thought before I do that, I thought I would at least provide you some thoughts about where I stand regarding the question before us here. It's been said a few times around the table this consideration of a sector split with potential reductions that would come from an analysis of the assessment update is an unknown.

We're planning for the worst but we're not sure what it's going to look like, and we don't have any idea today what that looks like moving forward. With that known, I would like to see the Technical Committee move forward and prepare options for consideration by the states, which looks at the commercial and the recreational fishery, and if reductions are needed to take each sector and assign a certain percent reduction to that sector, based on the overall removals of that sector, based on the most recent update of the assessment. It gets back to that table we discussed an hour ago, an hour and a half ago, related to removals. Because there comes a point with a commercial fishery, and I know not every state here has one.

But there is a point with a commercial fishery where it's almost not even worth operating any more. If this reduction that we're facing, this potential reduction is large, the state of Maryland may want to consider how to assign that reduction in fishing mortality based on the commercial and recreational fisheries, as an impact to those different fisheries.

I would like that to be analyzed. I think that's the information that you're looking for, Mr. Chairman, as far as not just a 50/50 split, but a disproportionate split of reductions based on the overall removal percentage. As far as size limits and seasons, in the Chesapeake Bay, I won't speak for the ocean, but for Chesapeake Bay I don't think an increase in size limits should be considered. That's just my opinion.

I think if we are to try to attempt reductions we should focus on effort to some degree, which would include seasonal modifications on harvest. I think by increasing size limits in Chesapeake Bay, we're only exacerbating the issue that we've been working for five or six years to try to reduce, which

are the dead discards associated with a larger size limit. That is just some feedback, Mr. Chairman, from what is presented before us. If Dave, I don't know if you want to go to Dave on Justin's question, but I was going to ask him to respond.

CHAIR GARY: Dave is on deck. He can comment on it then, but I would say we're taking some notes, staff and myself, so we have a couple concepts that are formed. Justin put out the idea of maintaining the slots, and taking off the books the minimum size shift. Then yours is the sector split, right, Mike. We'll come back to those two and see if there is any more support for either one of those. Next, I think we have Megan and then Dave Sikorski.

MS. WARE: I guess I'll start with the measures. Justin, I think what you said makes a lot of sense about maintaining the slot, so I would be open to that in considering adjustments to the slot, as opposed to just a higher minimum size. I think we need to think about where that 2015-year class is within that slot, so that might be something helpful for the TC to bring back to the Board to help us figure out the best way to go there.

But I think that makes sense, and I would prioritize a change in the slot over closures. I think it was previously mentioned, but I think closures you get into some questions about is it a harvest closure or a no-targeting closure. My understanding is I don't think we yet have TC analysis looking at the removals from no targeting closures.

I don't think we've tasked you guys with that, so that is kind of another component there. I just think we start to get down a rabbit hole pretty quick with that. In terms of the sector split, for the ocean I would be interested in the 50/50 split between the recreational and the commercial. Mike, if I'm understanding your suggestion, it was that each state would select its split in sectors, and you can let me know if that I'm understanding that correctly. But I think that inherently results in measures that are going to be different in each state. I don't see how that is not resulting in something that looks pretty similar to CE. But if I've misunderstood you, please speak up.

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CHAIR GARY: All right, thanks, Megan. We'll go to Dave Sikorski.

MR. SIKORSKI: First to Justin's question. I think it's a great idea. I think I've heard from a lot of stakeholders in Maryland that question why we have a trophy season any longer, and that has kind of lived on under this minimum size of, I think 35 inches. But I think our impact on the coastal stock being consistent with the other states is a great idea.

Frankly, I think it's time we talk about a max size limit across the board in all fisheries. I would like to see that option for both ocean and Chesapeake Bay, and when I say all fisheries, I mean commercial and recreational. This has been something that the public has called for a long time, it relates to the consistency and our ultimate goal of rebuilding, right.

Fish above a certain size are all SSB, and we want to maintain them. At a later date we'll talk about at what level, but we want to maintain them and grow them. I think that max size piece also brings some parity amongst the differing harvest that occurs in the Chesapeake Bay. Our Maryland commercial fishery has a 36-inch maximum, and has had that in place for quite some time, so I think matching that with the recreational fishery makes some sense.

I think it makes a lot of sense for our friends to the south to stop harvesting fish above a certain size in any fishery. Again, that's planning for the future, and it meets a lot of our goals and objectives of our management plan. When it comes to these percent reductions, God, this is bringing up all sorts of memories and hair falling out onto my keyboard throughout the Addendum VI process, because it reminded me why so many people find statistics so difficult in school.

You take a percentage of a whole, and that is the percentage right, and that accounts for the balance between two sectors. We had a lot of trouble with that in Maryland, and a lot of the other states you can see that chose to place their reductions unequally, reductions that are actually reallocation.

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I sat through enough fisheries meetings to hear; oh, allocation is tough. We don't like allocation. We do it all the time, and actually we're doing it right now. I think in order to conserve a fishery, you must reduce removals where they exist. I think the only fair and equitable way to approach any allocation in this fishery is to reduce somebody who is harvesting them.

I think unfortunately we've been going down these worm holes for the last many years, especially because of what my state has done with ad hoc reallocation. I do respect the idea that there is a certain level of harvest which, once you go below it maybe it's not economically viable to operate a fishery.

But that conversation has to be done more holistically, and it of course should be done back in Annapolis, where all of us can maybe be accountable to the people we serve. I'm a little stuck on that, but ultimately, I think the split based on a proportion of removals is all that we should be moving forward with. Otherwise, you're reallocating within this body, which should not happen.

MS. FRANKE: I just wanted to clarify here for the sector split question. I've heard a couple folks say that they are looking for the equal split, so commercial and recreational share the split evenly, and then based on Dave, what you and Mike have said, you are potentially interested in options that would split the reduction based on the proportion of removals, and so that would mean that the recreational sector would take more of a burden of the reduction. Is that what you're saying?

MR. SIKORSKI: No. If the reduction is let's say 10 percent, and both sectors take a million fish. Then both sectors were taking 100,000 less fish, right?

MS. FRANKE: You're saying equal split.

MR. SIKORSKI: The 50/50 is what throws me off here. It's not 50/50, because you have to know the number that we're multiplying 50 by, or 0.5 by.

DR. DREW: Right, are we talking equal in terms of percentages, in term so both sectors take the same percent removal or like in my mind 50/50 would imply that if we need to reduce by a million fish, then each sector takes 500,000, which would be different proportions.

MR. SIKORSKI: Very different.

DR. DREW: I just to be clear, and we struggled with this last time. The options are equal percentages, so both sectors take the same percent reduction versus each sector takes a different percent reduction. Last time it was based on sort of the proportion of removals, and so we could do something different or the same in this case.

But yes, the recreational would take essentially, I mean I don't think we're proposing that the commercial side would take a higher split, but if that is the prerogative of the Board. But essentially one sector would take a higher reduction and one sector would take a lower percent reduction on paper. Obviously, that carries through to different numbers of fish total, but the question is really about what percent we're applying here.

MR. SIKORSKI: My preference would be to take the total removals, decide upon the reduction necessary to meet our rebuilding plan, and then take that percent reduction and apply it to the total removals, and not move any across sectors in any way, shape or form. Last time, like the Board wanted in Addendum VI, but then states were able to use through this process.

The Board agreed that there would be equal split among sectors, and then some states chose to change that through the CE process. My preference is that moving forward, states could not change that through any process, and that all removals are reduced at the level that we decide is necessary. Therefore, we're not reallocating.

CHAIR GARY: Staff and I are compiling these concepts that everyone is advocating for. Next is Jason, so please continue to add to the existing or new ones, and then we'll try to come back to staff

and summarize if that's okay. Are you all good with that? We've got Jason and then Joe and Jim. Go ahead, Jason.

DR. McNAMEE: Just right up front. I'm in agreement with Justin's comment as well, so just to add a little more support for that. I have a question. I recall the Technical Committee did an analysis where, so one of the ideas with a slot limit is you're trying to protect a particular cohort or a couple of cohorts.

By its nature, you have to chase it, and so you would potentially have to move it up over time. I thought the Technical Committee looked at doing that. I think it was with the 2015-year class, and found that there really wasn't a need to kind of shift the slot. I could be misremembering or whatever the right word is for that.

What I'm trying to get to is, if that is not, you know shifting the slot, kind of keeping the slot the same size and shifting it. If that is not a worthwhile exercise, then maybe we should focus on shrinking the slot limit from either one side or the other, just to kind of limit the number of the sort of continuum of possible slot limits that you could look at.

Just to summarize. Curious as to whether that memory is correct, where an analysis was done and it was found to not have a lot of efficacies, as far as getting reductions or protecting that cohort, and if so then my contingency comment would be shrinking the slot limit would be an area to focus.

DR. DREW: The TC didn't actually look at shifting it, we only looked at constant measures and compared the slot and some different minimum sizes.

Essentially what we found is, if you keep everything static, we rebuilt in about the same amount of time, like you protected different components of those cohorts under the different situations for sure.

But keeping everything the same the question was basically, did you take a chunk out of that SSB early or late, and it didn't really have an effect on the rebuilding trajectory. But we did not actually look

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at could you move that slot or that size limit along with those cohorts, and get a different answer, which was I think the key to the original success of rebuilding striped bass was that minimum size moved up and up with that cohort.

I don't think we'll have time to redo that analysis for this exercise, but we could definitely look at, you know we could do a version where we shrink the slot, we could do a version where we move the slot up, and see which one gives us the reduction that we need. If they are the same, then the Board can discuss which one of those they prefer.

CHAIR GARY: Go to Joe Cimino next, and then followed by Jim.

MR. CIMINO: Thank you, and I'll start by answering Justin's question. I agree, I think it's just too early to pivot away from a slot limit, so I'm comfortable removing an option for a minimum size. Seasonal closures, I think especially if there hasn't been an analysis on what regional possibilities are for seasonal closures. I think just in the timeframe we have, and trying to take this out to the public on our own and come back in December. I don't really think we have the time to do that justice. Then last on the sector separation. In general, I like the idea of states being able to address where these issues are within their fisheries.

But I have two problems with it here. One, I think it would fall under CE. I'm under that same confusion of how it would work as Megan is, and we're under the assumption that CE isn't going to be allowed. I don't see it working here. Second, when you have fisheries like this, you know the possibility of a state needing to cut their quota by say 20,000 pounds, or shift that into the recreational fishery, where it's an additional day or two of a closure.

I don't really think the stock benefits from that type of protection, because I think that effort could easily be shifted in the recreational fishery. I don't think we're seeing that protection by saying on paper we're closing the recreational fishery an extra two days to cover for the commercial fishery. I think we do, unfortunately, need to do equal

reductions here, and I would just leave it at that.

CHAIR GARY: Thank you, Joe. We're going to go to Jim, then Robert T. Brown, and then Nichola. Jim.

MR. GILMORE: Just, I agree on looking at adjusting the slot limit. I think that's something we should consider, because we're going to have new data, and it's something we should hang around a bit. On the sector reduction, on the sector split. I'm going to be more simple on this. It's like I want to see the data.

I mean we're prejudging this right now, essentially saying should it be 50/50, should it be 80, you know whatever, 20, 15. I want to see the data, because if we determine today or make a decision that we're just going to leave it 50/50, and then we get into some difficulty in November. We have another option to look at, maybe some other ways of managing this thing.

At this point, I think it's important that we leave as Mike suggested, leave in the 50/50, but do the reduction based upon how the fishery is being prosecuted. I think that is the smart thing at this point. We can fight about it later on. I'm not going to say whether I like one or the other, but in November or a special December meeting, yes, we can really roll up our sleeves and get into it at that point. But right now, I want the data, so I think we should leave it in.

CHAIR GARY: Robert T. Brown.

MR. ROBERT T. BROWN: Yes, I'm going to agree with Jim over there. Also, the maximum size limit is what we need to protect our spawning stock, because that is our future. When it comes to these sector splits, we need a split. Our commercial fishery is really hurting in Maryland. If we get more of a cut, I think cut as many as we've had, it's hard for us to stay in business, and we are a food producer. We need to have the state have the authority to make adjustments as necessary. Thank you.

CHAIR GARY: Thank you, Robert T. Go to Nichola.

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MS. MESERVE: I do agree with the equal percent reductions, particularly when it comes to the coastal fisheries. I still may be open to this idea of the Bay as a region deciding upon something different, so that this idea of a state-by-state CE approach to different percentages seems out of line to me with Amendment 7. But I do think we need to make some decisions today that help the TC on that. I do like sticking with the slot on the ocean recreational fishery.

When it comes to the Chesapeake Bay recreational fishery, one point that I wanted to make about seasonal closures, which I know there is support for reducing you know predator harvest closures during the heat of the summer, reducing the release mortality. I just want to make sure that the closures that were implemented as part of a CE proposal for Addendum VI would not count as credit towards a seasonal closure that would be this additional reduction point here.

MS. FRANKE: Yes, that is correct. We wouldn't back calculate, add any reduction from previous measures that were implemented.

CHAIR GARY: We're going to take three more, and then I'm going to turn to staff who have been feverishly summarizing everybody's comments to see how we can pare this down. We'll go, all right, John, we'll give you four. It's going to be Mike, Dave Sikorski, Tom Fote and John Clark, and then we'll stop there. Mike.

MR. LUISI: A couple of people have raised the question about the comments that I made regarding the sector split being like a CE. The way that I look at it, and I'm kind of on the same lines where Jim Gilmore was going, was that once we have an opportunity to see what is analyzed and what is in front of us.

If the entire Board decides to use one option over the other, not trying to predetermine what the Board is going to decide on. But after you see the results of the analysis, if everybody goes in one direction that is not conservation equivalency that is an option for all of the states to fold into their

fishery management for 2023.

I'm not suggesting that every state get to choose between one or the other. But let's at least have an opportunity to see what it looks like, and to gauge the severity of the potential reduction, to determine whether or not those states that have a commercial fishery are willing to reduce it by a number that could be enormous. We just don't know yet. I wanted to, Mr. Chairman, just address Megan and Joe's questions on CE.

CHAIR GARY: Go to Dave Sikorski, Tom Fote and John Clark, you will have the last word before we go to staff.

MR. SIKORSKI: I've said enough about what I think. I just want to offer some clarifications. One, when I referenced a max size limit it's across all fisheries, so just for the record I would like to make sure that is noted, commercial as well. I'm perfectly fine with that being Chesapeake Bay focused, so the Bay fishery all fisheries would have a max size limit, and I would propose that a 36 would be a good starting point for calculation.

MS. FRANKE: Just to address that point. As far as reduction. For the commercial fishery we were assuming we would just move forward with quota reductions as the reduction mechanism, and not changing the size limit. I'll turn to Katie if she can say if that is possible, in terms of commercial side.

DR. DREW: I think it is possible, I'm not sure. It would be a different type of calculation than we normally do for these reductions, and it would be a little more complicated. If there is strong interest in pursuing that I think we can look into that.

But, generally speaking, the big change on the commercial side is going to come from adjusting the quota. But if there is interest from the Board about having uniform size limits across all sectors, within a region or across regions, we can look into that as a TC.

MR. SIKORSKI: Thank you. Equal percent reduction for both commercial and recreational takes into

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account the proportion of removals which occur in the commercial and recreational fisheries. Different percent reduction would further weight those reductions based on the proportion of removals. I would like to see it considered as a weighted reduction. I think that helps clarify the kind of general use of the term proportion we've been using today, because it is easy to get confused.

CHAIR GARY: Tom.

MR. FOTE: We talk about season closures. I brought this up the last time we started talking about season closures. It makes no real sense to basically do a season closure like Wave 3, 4, when the water temperature in the ocean is something like 49 to 53 or cold, and the hook and release mortality is basically about 3 percent or 4 percent.

We should do the season closures when it has the greatest good, is basically when the hook and release mortality is up to 25 or 30 percent, and that is during the heat. That is when the water warms up and the air temperature warms up. Let's do it, and common sense actually would do that.

Now the other thing, I know Katie was going to try and answer my question about the big fish about the hook and release, and, Marty, you kind of didn't let her. I know she was moving to answer my question, and we do have a study on the bigger fish on the hook and release mortality.

DR. DREW: The data is very limited. I think we do have a little bit of work in the Bay that says that older fish or larger fish have a higher release mortality. But I think the numbers are very limited, and I think it would be very hard to kind of extrapolate, you know 35 versus 36 or 28 to 32, type of a situation. The data do suggest that but it's very limited and would be hard to incorporate into a TC analysis.

MR. FOTE: Marty, if I can follow up on that. I think it's important we answer that question, so we know what the results are we're getting. You think you're protecting the bigger fish by hook and release, yet you may be causing more damage, because people

are targeting them. The second thing I've always talked about is, when you look at the thing, is it the big fish or the small fish which produce the greatest young of the year? I mean 95 percent of the females are sexually mature by the time they reach 34 inches. I mean that was the old standard, that is why you raised the size limit back in the eighties, basically to protect that '82-year class until it reached 34 inches, so 95 percent of the females. Do we know if those females, because I know when we did the data back then it was mostly young females showing up on the spawning grounds in Maryland, because we had to fight with the ones where we could basically test them, and actually a lot of them were hatchery raised fish, both male and female.

It is one of the questions we should answer, whether the viability of the eggs depend on the size of the fish. Older fish, because they have been able to produce more eggs, are they more viable, or the older fish eggs are not as viable as the young fish? We know that the older fish don't go up as often to spawn as the younger fish. Maybe we should clarify that at one time too.

CHAIR GARY: John.

MR. CLARK: Real briefly, I just want to support the idea of the slot and to reiterate what Jim and Mike said about making sure we keep both the equal, and take a look at what Dave has now reworded as the weighted reduction. But I would like to see that too. I want to see them both kept, thanks.

CHAIR GARY: Okay thanks, John, thanks Board. We're going to turn to staff now. I know I have my notes, and they've been taking them, so Emilie, can you bring us up to speed. Certainly, some things we've really coalesced around. A few others might need a little work.

MS. FRANKE: As far as the question of sector split, and what types of options for the TC to look at. It sounds like there is support for looking at options that would be an equal percent reduction for both the commercial and recreational sectors, and there is also support for looking at some options that

would be a different percent reduction for each sector that would weigh the reductions.

For example, based on proportion of removals, which would mean the recreational sector would take a higher reduction. I think the TC can look at options under both categories. Does that accurately capture what was said? Did we miss anything? We'll take both of those sector splits to the TC. I'm seeing some head nods.

DR. DAVIS: Just really quickly. If I remember right, in Draft Addendum VI we had something like this, right? There were two different categories of options. Is the idea we would use the same approach we used for Draft Addendum VI, just perhaps update the weights for the recreational versus commercial with the most up to date data?

DR. DREW: Yes, I think that would be, unless the Board has different specific guidance that they would like to say now, yes, we would use that approach for these two options.

MS. FRANKE: All right, so moving on to the commercial fishery. As I mentioned, typically the reduction has been achieved through quota reductions. We had a suggestion to also explore commercial size limit changes, that I think from the staff side is still a question. If there is more specific guidance on size limits for the commercial fishery, again, I'll turn to Katie. That's a new approach.

DR. DREW: Yes, I think part of the issue is that we don't have separate commercial selectivity curves, and we don't have a separate recreational curve. I think it's unclear to me how informative, or how much of an impact adjusting the commercial size limits would be, in terms of again, it wouldn't help us achieve.

It wouldn't change the reduction that we would need, but I think we could loop back and see if it would impact the rebuilding timeline in any way. But I'm not sure we would see a significant difference with looking at a commercial size limit. I guess we would definitely turn to the Board and see if this is something the Board is interested in

pursuing. It would be more complicated, but we could try.

CHAIR GARY: Go with Jason and Roy.

DR. McNAMEE: On this topic. I think what you would need to do is like an SPR type of analysis. While your short term, you know the sort of currency we're using of reductions wouldn't, I think it would be difficult to factor in there. You could look at the rebuilding. I think it could be done.

I'm going to recommend against it, because you're introducing again a much more indirect type of analysis, and one of the things we're talking about with striped bass is this kind of loss of productivity potentially, which plays into that type of analysis where you sort of make assumptions about productivity.

While I know it can be done, I would not recommend that, in particular for, it's something we could look at for some subsequent step here. But in this idea of trying to get something in place in a short term, to be protective of the stock, I don't think this would be the right approach.

CHAIR GARY: Roy.

MR. ROY W. MILLER: With regard to commercial reductions. I'm not a fan of commercial size limit changes in this particular case for a couple of reasons. I think it might create the need for use of different mesh size gear. That would be an unanticipated expense for the commercial fishery. There might be market consequences. I think a straight quota reduction is pretty straightforward. I think that can be easily accommodated. I think the commercial size limit change would have a more unpredictable effect on the commercial industry.

CHAIR GARY: Ritchie White.

MR. WHITE: I agree with Jay and Roy.

CHAIR GARY: All right, I would like to go back to Emilie. Do we have a little bit better resolution after that feedback? Do we still have some gray areas that we think we need to clear up?

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MS. FRANKE: I guess I would turn back to Mr. Sikorski, as far as, Katie mentioned they could do some exploratory analysis to sort of get a read on how this would impact rebuilding the stock, if that would address your suggestion.

MR. SIKORSKI: Yes, I think that would be helpful, and that would be in lieu of a specific percent reduction, is that correct? That's my expectation.

DR. DREW: Well, I mean I guess that would be the question about how would it be. Are you proposing a commercial size limit change in addition to a quota reduction, or instead of a quota reduction?

MR. SIKORSKI: I would say separate from, so not one or the other. In general, I think this is a good concept for this Board to bounce around, protecting fish above a certain level. If it means you can provide some more information about it in this current context that would be great. But I've heard the opposition as well, and I think this will definitely take more time.

But, my thought process on this goes all the way back to the working group which led to Amendment 7, and how protection of striped bass and then spawning closure protections have not been taken up in a substantive way by this Board yet. I think those two pieces of the puzzle should be, so I'm just taking this opportunity to continue to bring that up. I would look to your best judgment on this. I understand it's not a priority for affecting removals at this time.

DR. DREW: Yes, so we can look into that. If time and the TCs workload permits we can report back on what that would potentially look like. If not, maybe we can bring it back at a future Board meeting down the road.

CHAIR GARY: Emerson.

MR. HASBROUCK: I was just going to suggest relative to this size increase, or change of size, rather on the commercial fishery. It was just mentioned that that would be in addition to a quota

reduction. I think the TC is going to have an awful lot to do, once the assessment is finalized.

If this is kind of an exercise to look at what the impact might be, to change the size limit in the commercial fishery. If we're going to get a reduction, and either of the two bullets there under the first item, then I don't know why at this time we're going to explore size change, what the impact is going to be there. It seems to me we've got enough to do.

CHAIR GARY: Robert T. Brown.

MR. BROWN: This is unnecessary changing the size limit on us, as we've got different sized markets for different sized fish. You know some restaurants want pan size fish, a smaller fish, some want a large fish for baking and stuff. It's not a good idea to adjust this at this time. I think we've got enough on our plate.

CHAIR GARY: Any other comments before I turn back to staff and we take another look at what we've got up on the screen? Anything we missed, any comments you would like to add? Mike Luisi, I was wondering, could you clarify? I'm just curious. I know trying to hear you. The bottom of the screen, what we put up there. I'm not sure we completely captured it, but can you further expand on what we have up there, and what exactly you had in mind, to make sure we have it either stays or it goes.

MR. LUISI: You're referring to the Chesapeake Bay recreational? Yes, I think it was Dave who recommended some exploration with a slot limit, which I think is something I certainly would support. I also, so where we are in Chesapeake Bay is that unlike the coast, Virginia, Maryland and Potomac River have very different rules and regulations that have evolved over time with the use of conservation equivalency.

As was stated earlier, you know one of the goals here is to potentially find some likeness amongst the jurisdictions within the Bay. But given where we are, I don't see us coming together in any way,

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shape or form in one step, in one hop. What I would like to see. I mean if you're asking me what I would prefer to see in November, I would like to be able to look at recreational measures by jurisdiction in Chesapeake Bay, if reductions are necessary, where the states can add to their already frozen rules that we have now.

If we have summer closures in place, we could extend those summer closures. But because Maryland and Virginia have such different closure periods for striped bass, where Virginia is closed, I think from the middle of June through September, and fourth of October. Maryland has a two-week closure in July.

Trying to find something that we can both agree on is not going to happen overnight. But if we could add to that as a way of reducing our mortality, I would like to see it by state. Maybe that is what you're getting at, Mr. Chairman. There is not going to be one rule that all the jurisdictions in Chesapeake Bay are going to be able to say, oh that works for us.

But it would be nice to have the TC kind of stack those three states to the side, and give us some options to pursue, whether it's slot limits or additional seasonal closures on top of what we currently have, so that we can implement those, with the mindset that we're trying to find something that is more alike between the jurisdictions. It would be incredibly difficult to do it in one step.

CHAIR GARY: It was the season closures, I just needed some expansion on what that meant, so I appreciate that. Bill Hyatt.

MR. HYATT: Just a quick question for clarification. I'm looking at what's on the screen, and seasonal closures are only listed under Chesapeake Bay recreational. I just want to make certain that that is where we're going with that. It's limited to that geographic area for the purposes we're planning. I think I'll preface that with, that's what I'm hoping is the case.

Given that we've heard many, many, times the problems with enforcement associated with seasonal closures, the problems with uncertainty around angler behavior. As a result, I have very little confidence that they could be used and applied broadly, and modeled effectively. Just asking for that clarification based on what I see on the screen.

MS. FRANKE: Yes, for the ocean recreational measure it sounded like there was pretty much consensus to focus on just adjusting the slot limit. Sticking to that either shrinking the slot or shifting it, and then what I just heard as far as Chesapeake Bay. We heard before, looking at seasonal closures, potentially looking at a slot with some sort of maximum size limit. Then I just heard a suggestion, I guess in addition to one default measure looking at state-specific options in the Chesapeake Bay.

CHAIR GARY: Yes, I think I heard the same thing, Bill. Megan Ware actually started that point about the closures. You mentioned that before, Megan, I think. Did you want to pick up on that? Did you want to respond to Bill's point about that? Is that what you're thinking?

MS. WARE: I was going to respond to Mike's comments, but I'm happy to just get in the queue.

CHAIR GARY: Okay, that will be fine. Let's go with Justin, and then Megan, back to you.

DR. DAVIS: I don't want to move away from what Mike brought up, because I think it's important, but quickly. I didn't think we had much discussion about season closures in the ocean recreational fishery, and from my standpoint, I don't like the idea of season closures, but I feel like I'm uneasy about taking them off the table at this point. I view them as kind of an, in case of emergency break glass, kind of thing.

If we end up needing a really large reduction, such that a slot is going to become just too narrow and unworkable. It seems to me as season closures might be the relief valve there. I'll preface that by saying, I think it should be harvest closures, not no targeting closures, because as Bill was alluding to, I

don't think not targeting closures are workable from a regulatory standpoint.

But I would be in favor of leaving no harvest season closures in the tool box for ocean recreational fishery, with the idea that it's a non-preferred option that we would only look to if we were looking at a pretty substantial harvest reduction, and accordingly a very narrow slot without season closure.

MS. FRANKE: Just to respond to that. I think that is a reasonable guidance to the TC that could be to consider season closures if the slot limit is unworkable.

DR. DREW: Would you be looking for a single season closure along the coast, or would you allow states to have some flexibility in adjusting that seasonal closure?

CHAIR GARY: Go ahead and answer, Justin.

DR. DAVIS: My preference would be to allow states flexibility to adjust the seasonal closure state by state, because I just don't think one blanket closure for the entire coast makes sense, given how the fish move up and down the coast.

CHAIR GARY: We'll go to Megan, then Jason McNamee, then Emerson.

MS. WARE: Mike, I think this is a question for you, but in the bullet about state-specific measures, are you thinking about that specific to additional seasonal closures, or also about bag limits and size limits? I guess I'm thinking back to Amendment 7, where there were options for two-week closures based on different wave criteria, I'll say. Is that kind of what you're thinking about, or are you thinking about that outside of season closures?

MR. LUISI: I'm sorry, Megan. I'm having a hard time just understanding the question. Can you restate it?

MS. WARE: That's okay, I'll try again. Are the state-specific measures you're thinking about just state-

specific seasonal closures, or is it state-specific bag limits and size limits, different from what you have in current CEs?

MR. LUISI: In the current CE plans that we have, both Maryland, Potomac River and Virginia all have different minimum size limits. We also all have different seasonal closure periods of time, and in Maryland we have a private angler 1-fish bag limit, and a charter boat 2-fish bag limit at the 19 inches.

Based on the previous discussions, where we have kind of, I guess the Board has selected the conservation equivalency measures as being the starting point for change. My vision would be that Maryland, Virginia, Potomac River have those CE measures kind of frozen in time. Then when reductions are necessary, if it's 15 percent that's needed, each state would see under itself certain things.

You could take an additional closure with the flexibility. A Maryland closure is going to be different than a Virginia closures, as far as when it's taken and how much credit you get for it, just based on when the catch happens. I kind of envisioned each state kind of being given by the TC a reasonable measure to implement based on that frozen measure to start with.

That could be something we move forward with, rather than one measure across the board that everybody just puts in place. That would be how I would prefer to see it. Now, if the Technical Committee can also come up with that one, you want to call it the default measure that all of us could agree to, then I would be happy to entertain that. It's just I'm not sure that's going to be as easy to accomplish as some might think.

MS. WARE: Okay, that is helpful. I'm really not trying to be a stick in the mud, but what it sounds like is that each state would have a percent reduction, and then different suites of measures would be crafted, I'll say, for each state to achieve that percent reduction. In my opinion, that is CE. What I would be comfortable with, because I recognize that you guys are all starting in very

different places, and that there is going to need to be some flexibility there.

But I think you know something, I would be okay considering, at least in these measures is, you know we just had a comment about seasonal closures on the ocean side. Let's say we had to take a 10 percent reduction with the seasonal closure, and each state would determine that. I think to be fair; we would have to offer that same opportunity to the Chesapeake Bay states, but that is very specific to the seasonal closure that is in maybe a specific wave that is you know 25 percent of your catch, or whatever it was in Amendment 7. What I'm not comfortable with is each state saying, you have a 10 percent reduction and you come up with the suite of measures that achieve that, because I think that is CE.

CHAIR GARY: Thank you, Megan and Mike, it was informative. I think we're close. We have two more folks that would like to comment, and maybe a little bit of time more, but I would like to wrap this up if we could. We still have one more issue on the agenda to go through. Jason McNamee, and then Emerson.

DR. McNAMEE: I won't weigh in on the discussion that just occurred, and in fact I'll be super brief and just say. You know the discussion on the ocean recreational fishery, and seeing that seasonal closures wasn't there was something that is making me a little itchy as well, simply because it's a tool. Just to reemphasize what Justin said. Having it as a potential option, but a lower priority option if it's needed. I'm in support of that. If we cannot use it that's great.

CHAIR GARY: Emerson, we're going to go to you, and then hopefully can come back to Emilie, summarize it, and I'm keeping my fingers crossed we have a suite of items that we can achieve consensus on. Go ahead, Emerson, bring us home.

MR. HASBROUCK: Yes, I want to agree with Justin and Jason. In the ocean fishery we need to have that option to consider seasonal closures. You know if the slot doesn't work for us, and that those

seasonal closures should be flexible.

CHAIR GARY: Emilie, are you able to go ahead and summarize what you've got on the screen, and see if we can't get Board consent?

MS. FRANKE: Sure, so I will, I think we covered the sector split and the commercial reductions already. Again, I'll review the recreational measures. I'm still a little bit unclear on moving forward with the state-specific options that Mike brought up, but I will start with the ocean recreational.

Again, it sounded like there was consensus to first look at adjusting the slot, either shrinking it or shifting it. Then considering seasonal closures if adjusting that slot limit is unworkable. Sort of a lower priority than the slot limit, but if needed consider seasonal closures that would be flexible among the states.

On the Chesapeake Bay side, we heard adjusting seasonal closures, considering a slot limit, or implementing some sort of maximum size. Then also, in addition to one Chesapeake Bay default measure, looking at state-specific measures, and I'm still unclear as to whether the TC would only be doing that state-specific closures or if we're looking at other types of state-specific measures as well. We might need a little bit more guidance on that.

CHAIR GARY: Dave.

MR. SIKORSKI: Yes, that is exactly where I was confused as well, and I think in the conversation that unfolded it opened up as a seasonal closure's clarification, and that is where Mike provided it. I would offer that that third bullet point actually fall under seasonal closures, as a further refinement for the Chesapeake Bay states, state by state. The only thing that we're looking at is a seasonal closure, because of the reasons Mike provided, and they are how far apart the jurisdictions are with their seasons, based on availability of stock to the fishery.

I think that change you've just made is consistent with the discussion we've had as well as the point Megan raised earlier, regarding the clear focus on consistent measures in the regions in the

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Amendment 7. If a reduction is necessary, we're operating under Amendment 7, with only bits and pieces left of CE. I think what's on the board there is what we'll be able to use moving forward, if that reduction is necessary. Let me just say consistent measures in the regions.

CHAIR GARY: Mike.

MR. LUISI: Thanks, Dave, you know I was even confused as I was talking, and that's never good, a few minutes ago. I guess the last point here is just to be clear. The first point is that I don't have any intention of trying to pull one over on the Board and try to get some kind of conservation equivalency plan put forth, you know with help from the Technical Committee. There is no intent there. I'm just looking to make sure that what is produced is something that we'll have an ability to work with.

If we're starting with our baseline measures, and we're folding in possible seasonal closures at a state-specific level in addition to a consideration for a slot size, starting without starting point, which is all of our states have different minimum sizes and bag limits and things, and we move that through. I can live with that. I just want to make sure I'm clear with what I'm hoping for at the end of this process in November, so we have something to take to the public.

CHAIR GARY: Okay, Emilie, are you all comfortable with what you have?

MS. FRANKE: Just to respond. Again, as we've just discussed, we can look at state specific seasonal closures. But although we're starting with a baseline of what was in place in 2021, you know unless the Board says otherwise, you know we're looking for some sort of one default Bay size limit. Right now, we're potentially looking at some sort of slot that would be the same across all states. That is the typical approach unless the Board says otherwise.

MR. LUISI: I'll call on myself, since I had the microphone last. I think yes, a consideration of a

Bay-wide slot limit is certainly something for consideration. The bag limits, I think to leave them alone at this point would be what I would prefer, to see the bag limits maintain static throughout the analysis.

CHAIR GARY: All right, thank you, Mike, thank you Emilie and Katie. We have what we have, right? One more hand, oh three more hands, okay. All right, please be brief though. We're going to go, Nichola, Justin and Tom, but please be as brief as you can.

MS. MESERVE: I just wanted to draw a distinction for the Chesapeake Bay measures here, between adopting a maximum size, which would be a new FMP standard, which CE cannot be changed. A state can't use CE versus adopting a new slot that would be 18 to 36, for example, because that would be changing the FMP standard that exists of an 18-inch minimum size, and it would throw that whole CE question back into play for me. If the states want to keep your 18 or 19, a minimum size that they already have as part of their currency plan, I think the additional measure just needs to be a maximum size. I think there is a distinction to be drawn there, because I am a little bit uncomfortable with the proximity to CE right now, with some of this stuff. I think that some distinctions like that are important to be made.

CHAIR GARY: We'll go to Justin.

DR. DAVIS: I just wanted to offer one clarification under ocean recreational, and I'm hoping folks agree that we should consider season harvest closures, but not no-targeting closures, because again, I think no targeting closures are unworkable from a regulatory standpoint. Also, I don't think we would be able to calculate what savings we would get from a no-targeting closure, so they wouldn't really be helpful in this instance at least, doing the math.

I also wanted to offer the comment. I understand the tension here between wanting to honor the spirit of Amendment 7, and not allowing CE when the stock is overfished, and accordingly wanting to

see uniformity in the Bay, where the process we're engaged in here is new, not something we've done before.

It is not going to allow for the typical amount of deliberation and public comment. I think we should avoid trying to make really large changes to any jurisdictions regulations as part of this process, because of the sort of unorthodox nature of it. I think that's two things to keep in mind going forward.

CHAIR GARY: Okay, Tom, make it brief.

MR. FOTE: Real brief. Let's take a five-minute break before we start the next topic, because we've been sitting here for two hours and 50 minutes, and we need to walk around and get our minds clear.

CHAIR GARY: You read my mind. That is going to happen, but it will be a hard five minutes. Okay, Emilie, do we need any more description? We're good with what is on the screen? I'm just going to ask a simple question. Any objection to what is on the screen? Seeing none that is what we have, and Katie, just one question. Just to be fair in asking the question, is this management for the TC? That is one of the things we wanted to do, right?

DR. DREW: Yes, I think this is manageable.

CHAIR GARY: All right, Tom, Emilie is going to put five minutes on the clock, it's hard five minutes. Everybody be seated and ready to go for our last item, thank you.

(Whereupon a recess was taken.)

**CONSIDER NEXT STEPS FOR DRAFT ADDENDUM I
ON QUOTA TRANSFERS
(FORMERLY DRAFT ADDENDUM VII)**

CHAIR GARY: All right, up next is Number 6 on our agenda. Consider next steps for Draft Addendum I on Quota Transfers (formerly Draft Addendum VII) Possible Action. Motion was from October, 2021, the motion was: *Move to defer until May 2022, consideration by the Atlantic Striped Bass Board of Draft Addendum VII to Amendment 6 to allow*

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further development and review of the transfer options. I will turn at this time to Emilie to provide background and an update to everyone, and we'll go from there.

MS. FRANKE: I'll provide a brief overview of the Draft Addendum and the Plan Development Team's comments and the potential next steps. Starting with the background on this action. In February, 2021, the Public Information Document for Draft Amendment 7 included the issue of commercial quota allocations. But that issue of commercial quota allocation did not move forward to become part of Draft Amendment 7.

Later that year, last year in August, the Board initiated a separate management action, which was then Draft Addendum VII, which is now Draft Addendum I, to consider allowing voluntary commercial quota transfers between states with commercial quota. This action only applies to quota in the ocean region. The Chesapeake Bay jurisdictions have a separate commercial quota, so this Addendum only applies to ocean commercial quota, and does not consider transferring the quota between the ocean and Chesapeake Bay or vice versa, just ocean only.

Back when the Board initiated this Addendum last year, Board members recognized that this Addendum could be a management option to provide some immediate relief to states, sort of separate from a full reallocation discussion. Based on where we are now, here is the draft timeline for the Draft Addendum. After the Board initiated the Draft Addendum in August, 2021, the Plan Development Team developed the draft document.

In October of 2021, the Board deferred consideration of this Addendum until May 2022. Then it was again postponed until discussion today in August. Today the Board is considering next steps, and if the draft addendum is approved for public comment today, then the public comment period would take place over the next few months, and the Board could consider selecting final measures at the annual meeting in November of this year. Marty just read the motion from October.

Draft Proceedings of the Atlantic Striped Bass Management Board Webinar
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The original motion to defer consideration, and again since Amendment 7 is now in place this is now Draft Addendum I to Amendment 7. The Board action for consideration today is the next steps for Draft Addendum I. If the Board wants to move forward, the potential next steps would be to either approve the draft addendum for public comment today, or to provide some additional guidance to the Plan Development Team, and consider a revised draft at a future Board meeting.

The Addendum document includes an introduction, statement of the problem, background, the proposed management options and the compliance schedule. If the draft addendum moves forward, then the background section would of course be updated with 2021 data, since this document was developed last year, and also a summary of what was approved under Amendment 7.

Today I'll just review the proposed management options and the discussion from the PDT memo, which were included in the meeting materials. Option A is the status quo, in which no commercial quota transfers are permitted. Option B is the alternative that would allow voluntary transfers of ocean commercial quota. Under this option transfers between states may occur at any time during the fishing season up to 45 days after the last day of the calendar year. All transfers require a donor state and a receiving state, and the Administrative Commissioner of the two state agencies involved must submit a signed letter to the Commission, identifying the amount of quota to be transferred.

There is no limit on the amount of quota that can be transferred, and the transfer becomes effective upon receipt of a letter from the Commission staff back to the donor and the receiving state. This does not require the approval of the Board. All transfers are final upon receipt of those letters. These transfers do not permanently affect the state-specific shares of the quota.

Once the quota has been transferred, the receiving state becomes responsible for any overages of the transferred quota. As outlined in the memo from

the PDT, there were some concerns with adding commercial transfers to the striped bass FMP. If the Board does approve the draft addendum for public comment, the PDT recommends adding their concerns into the draft addendum document.

The PDT notes that similar concerns were raised by the Technical Committee back in 2014 when transfers were considered as part of Draft Addendum IV. The first concern from the PDT is that transfers could potentially undermine the goals and objectives of the Addendum VI reduction. The PDT Noted that the commercial fishery consistently underutilizes their quota, again due to some states not allowing commercial fisheries, and also due to factors like fish availability.

You know, we assume with reduction calculations that the commercial fishery would perform similarly to how it has in the past, assuming some percent quota utilization. This assumption of a constant quota utilization would be violated if transfers are permitted. That was the first concern of the PDT.

The second PDT concern is that a pound of commercial quota is not equal across all states. Through CE, states have been able to adjust their commercial size limits, and this has resulted in changes over time to state's quotas. For example, for Addendum VI, Massachusetts and New York changed their size limits, which resulted in changes to their commercial quota. Again, these types of changes have been occurring since before Addendum VI.

Given additional time, the PDT noted they might be able to address this issue and consider some analysis of all the different size limit changes that have been made affecting commercial quotas over time. Again, just to wrap up, the Board action for consideration today is the next step. The potential next steps could be approving for public comment or providing some additional guidance. I'm happy to take questions.

CHAIR GARY: Thank you, Emilie. Before we take questions, I'll just remind the Board we have a hard stop at 5:45, so we have 40 minutes and I would like

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hopefully not for it to be 40 minutes on the nose to finish our business. Let's have a thoughtful but expedient deliberation and discussion. Questions for Emilie. John.

MR. CLARK: Not so much a question at this point, but just to speed things along. About the PDT concerns. I would just like to point out that yes, there is underutilized commercial quota, but that quota is still there, it's latent quota. Good example would be North Carolina. If the striped bass come back to North Carolina, I communicated with our colleague in North Carolina, Mr. Batsavage, and he confirmed that yes, their fishery could easily catch the striped bass again.

I just want to make clear that, I mean we shouldn't be moving ahead under the assumption that that quota should never be touched. I mean if we want to take quota away there is a better way to do it than just leaving it latent there. I just wanted to make that clear, and also just point out that the scale of things we're talking about of a quota that probably would be transferrable, once again referring to North Carolina.

Sorry, Chris, but as the saying went about why banks get robbed is because that is where the money is, that's where the quota is right now, the unused quota. Anyhow, just wanted to point out that even if that entire quota was taken, based on average removals from the past three years, we're talking about 1 percent of removals. Anyhow, without going further on. Everybody has seen the motion, so you'll know that I'm thinking there are ways the Board could control how much gets transferred anyhow.

But I just wanted to point out, we're not looking at a lot of fish here, and I understand the second concern of the PDT about a pound of quota being different in certain states is valid, but it does not seem insurmountable, and once again we're not talking about a lot of removals here, even if the entire North Carolina quota had been caught, which once again they could do it, but just wanted to point those things out.

CHAIR GARY: Additional questions? All right, so we'll open it up to Board discussion on the issue. Jason.

DR. McNAMEE: We're in discussion, I just want to support what John just said. I mean I think just to restate what John said. We have these quotas, they are there. I understand the notion of the assumption, and don't dispute that. However, we shouldn't be setting quotas that we aren't comfortable that they might be harvested.

If there is a problem with the current state of the quotas, we should address that directly. I'm in agreement with John there. I thought the second concern was a little more compelling to me, which I think was getting to the point of different selectivity's, potentially, in the different areas, which I'm in agreement with.

That part, I think the concern is a fair one. However, then I was kind of looking at the magnitude of what might be getting transferred, and I can't imagine we would ever actually be able to detect that within the tools that we have available to us. I guess I'll suggest that I would be supportive of, I think part of the process we're in is putting this out for public comment.

Because I think it's something that happens in other fisheries. I know the striped bass fishery is not in good shape, so maybe the timing is not great here. But, maybe that could be addressed during the process, maybe some contingency that it can't be activated until stock status improves, or something like that. But the general concept I don't have a problem with. I don't foresee there being a lot of this trading going on. It looked like in the table we saw earlier; most people's quotas are being maximized most years. If there is a little flexibility that we can put in here that might be helpful to a state or two. I would be supportive of that.

CHAIR GARY: We'll go to Jim Gilmore and Joe Cimino.

MR. GILMORE: Yes, and I agree with most of what Jason had said. John, I think we're talking about

small numbers, and I think you hit the nail on the head. The one thing, you know in going to what the PDT said about some of those concerns. You know I think you addressed them pretty well.

The one issue, and Jay just mentioned it, was timing. We go back to this morning. If you go back a few years ago, I think a lot of states, including New York, were not even coming close to harvesting the commercial quota. We'd be creeping up on it, I think that last graphic we saw this morning was most of the states were at 98 percent of their commercial harvest, so we're close to it now. We don't have any buffer left.

Now we're kind of like, I think on the schedule we would be voting on this at the November meeting. But at the November meeting we're also now adding on another meeting in December, because whatever. I think to Jay's point. If we had to do the final approval at the November meeting that might be a little soon.

Unless we did have a deferment as when we would implement it, because it seems to make more sense that we would be approving this at the same time when we're seeing what the assessment comes out to look like. Generally, I agree with all of this. I think the concept makes sense, it's consistent with what we do. It's just that that little mismatch of timing in November and December may be a perception issue we may want to consider, and maybe delay this to that following month when we're doing that big meeting on striped bass.

CHAIR GARY: Joe.

MR. CIMINO: I just agree with everything that Jay and Jim just said. I would be interested in maybe visiting some way to have a deferral of when this would kick in explored, if that is possible. You know it really does bug me, the notion that we walk away from the table thinking we set a safe harvest level, but that is only under an assumption that it's 100 percent underutilized. There needs to be another way to handle that, if that is really what that concern is saying.

CHAIR GARY: I'm going to go to Ritchie White and then Nichola.

MR. WHITE: I'm certainly in favor of sending it out to the public. I always want to hear what the public has to say. I agree that I think the timing is very difficult, and I think the concept from a public standpoint of increasing mortality, even though it's extremely small, at the same time we're going to possibly reduce mortality substantially. The public, I think it's pretty obvious where the public is going to weigh in on this. I would suggest that it get delayed, but certainly support it going to the public now, if that is what everybody wants.

CHAIR GARY: Nichola.

MS MESERVE: I feel similar that this get the light of day at some point. I'm not comfortable with approving it for public comment today. John has e-mailed us some suggestion options to add, which I think the PDT should see, so they could potentially add to provide support. I think the PDT in their memo suggested that they might have some additional options to add to it as well. It was developed pretty quickly, at the same time as all the priority was put on Amendment 7. I think there is additional development that is needed before letting this go.

CHAIR GARY: Tom Fote, and then Roy Miller and Dennis Abbott.

MR. FOTE: While you get a letter of attendance at meetings. I was going through a box of mine where I have 300 hats in there that I keep throwing hats when I come back, and I found five rollover hats. Remember when we basically tried to do the rollover, carry over quota for the next year. We wound up with, I guess 150 people in the audience wearing no rollover hats.

If you want to get people in attendance at Striped Bass Board meetings, or try to increase the commercial fishery, and you'll see them out in full force. It would nice to see them at meetings for a change and getting involved again in the fishery. But this will do it. It's up to you if you want to do it.

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I mean go out to public hearings.

It will be interesting. We've done that before, and it really just gets everybody mobilized. They are so bad about letting people take home fish to eat, and they show up in force to make sure it's a catch and release fishery. Wait until you try to open up a larger commercial fishery, and see the response.

They will especially look at the numbers that have been increasing in the commercial fishery. Maryland now is what, 50 percent of the overall commercial quota, or last year they caught 50 percent of the overall commercial quota both in the ocean and Bay combined. I think it would be a lot of interesting things going on there. But it's up to you guys.

CHAIR GARY: Roy Miller.

MR. MILLER: Just to start off I would like to say, this is not a proposal to increase the commercial quota. It's just a shifting of where that quota allocation would come from. Secondly, I think I support the suggestion that there be no further action on this particular request until after our December meeting, and we see what reductions are necessary.

I think it would perhaps send the wrong message to approve it now, prior to getting the word from the TC and the Plan Development Team about what we need to do in December. But I have no problem with advancing the concept now, so that it will be ready for action once we have the results of the December meeting.

CHAIR GARY: We have Dennis Abbott, John Clark and Cheri Patterson.

MR. ABBOTT: Though I understand, you know we're not talking about a quota increase. We are talking about the resulting dead fish increase that we would have. I also think it is bad timing right now to consider this. I would be in favor of tabling this to a later date. Even if we went ahead with this and enacted it, it would be somewhat like we do with menhaden, it requires two parties. John talked

about going where the money is in the bank, that's why they rob them.

You can't rob a bank unless someone else opens the door in this case, so whatever. I do think that we should set this aside, because I don't think it makes us look too good in the public eye on one hand to be going in one direction with reductions, and on the other hand increasing dead fish. I mean that's the bottom line. This would produce dead fish if there were quota transfers.

CHAIR GARY: John Clark.

MR. CLARK: To that end, I mean obviously it hasn't been good timing to bring this up, pretty much at any of these meetings. But particularly over the last couple of years. That is the reason I sent out that motion. I don't know if we want to get to that yet, Mr. Chair, but what I wanted to do, in order to move this along was to put the mechanism in the actual addendum that would allow the Board to decide, you know no matter when the Addendum passes, it would still be up to the Board to decide whether to allow transfers. Just whenever you're ready for that motion, you can come back to me.

CHAIR GARY: We're going to do three more comments and cut it right there. Cheri, you're next and then Megan and Dennis, you have a last comment you want to make, right? Go ahead, that's fine.

MR. ABBOTT: Yes, just quickly. I did want to comment that this whole concept, I was sympathetic in particular to one of our fellow commissioners, Craig Pugh, who I was hoping would be here to advance his case, because he and I had some good conversations about it, and I would like to say I am sympathetic to Delaware's issue.

CHAIR GARY: Go ahead, Cheri.

MS. CHERI PATTERSON: I'm just concerned about confusing the public, going after them with a couple of these issues back-to-back. As I've heard, you know one is positive, one could be a negative. I just think it should wait until we have some clarity

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before we move forward with this one.

CHAIR GARY: We'll go to Megan for the last comment, and then I believe John, you have a motion to tee up.

MS. WARE: Actually, I had a question for either Emilie or Katie on the issue of quota, where I think the example given was Massachusetts is a different minimum size than New York, and kind of the lack of the equality, I'll say, in the quota between those two states. Do you foresee the PDT, given time, being able to come up with a solution or a mechanism to equate quota from one state to another?

DR. DREW: Yes, absolutely. I mean we essentially already do that for several of the commercial CE plans. Our removals that we calculate from the assessment model are all in terms of numbers of fish, so I think it would just be a matter of saying, you know X pounds of quota in Massachusetts equals this many fish.

We're going to move it over to Delaware, you can have this many fish, which based on your fishery would account to this amount of weight. I think we would have to do some calculations behind the scenes, but the key would be that we are harvesting the same number of fish, and not necessarily the same weight. But I think that would address the PDT's concerns.

MS. WARE: Okay, I mean I would be in favor or seeing that from the PDT, kind of knowing what John's motion is, and I think that addresses some of the PDT's concerns. If that could be done to address the other concern, I think that would make it a stronger document.

CHAIR GARY: All right, John, do you have a motion to put up?

MR. CLARK: Yes, thank you, Mr. Chair. I sent it in, do you have that, Emilie?

MS. FRANKE: We do, yes. Thank you, Maya. MR.

CLARK: Would you like me to read that? MS.

FRANKE: Yes, please.

MR. CLARK: Move to add the following provisions to Draft Addendum I to Amendment 7 under Option B Commercial quota transfer provision of the coastal commercial quota: The Board will decide by their final meeting of the year, based on the information the Board has available on the status of the striped bass stock and performance of the commercial fishery, whether to allow commercial quota transfers in the next year.

If the Board approves commercial quota transfers, the Board may decide to limit the transferable amount of quota to a set poundage or a set percentage of the total commercial quota. The Board may also choose to specify the following criteria: The eligibility of a state to receive a transfer based on percentage of that state's quota landed (e.g., state may not request quota until it has landed 90% of its annual quota) The allocation of allowed transferable quota among seasonal fisheries (e.g., 50% reserved for states that have spring fisheries, 50% reserved for states with summer or fall fisheries).

CHAIR GARY: We have a motion by John Clark, is there a second to this motion? Eric Reid. Before we go with discussion on the motion, I would like to take just a couple of minutes for public comment on this. Is there anybody in the room or virtually, could you raise your hand? We're going to make this really brief. Is there anybody in the room here in Arlington, Virginia that would like to make comment? Is there anyone online that has an interest in making comment? We have one person, and they are.

MS. KERNS: Patrick Paquette.

CHAIR GARY: All right, one person online that would be Patrick Paquette. Go ahead, Patrick.

MR. PAQUETTE: Thank you, Mr. Chairman, Patrick Paquette. I would like the Board to consider adding into this document an option that stated that, and it

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addresses a couple of concerns. But I would like to see an option where the tool is allowed, but only when the stock is not overfished, or only when the stock is at the SSB goal.

Like some status of hey, we can move quota up and down the coast. Because right now the stock, we have availability issues up and down the coast, and that is based obviously on a stock that is borderline, you know flirting with recruitment failure. We're trying to shepherd single year's classes.

I think that in a healthy stock this tool, and I have no problem with this tool, so I'm thinking that the public would be interested in commenting on when the tool is available in a stock that is having problems. I think that it would be beneficial, instead of just having angry comments from the public, give the comment to give the public the option to comment on stock status and when this tool is appropriate. Thank you.

CHAIR GARY: Thank you, Patrick. All right, we'll open it up to Board discussion. Steve Train, Pat Geer and Nichola and Eric.

MR. TRAIN: Sympathetic to what Patrick said. I think that makes sense. But I think the fact that it comes back to the Board before it's decided kind of gives us a chance to make that judgment, so I don't know if it has to be in there. Secondly, I think what we need to remember is this fishery, this species, this is a public resource.

Most of the public's access to this fishery is through the commercial fishery, when they sit down at the dinner table and eat it. It's not going out on the water. That is a very limited number of people that actually has that access that way. I think that if we have allowed a quota that we think is sustainably harvestable, and one state chooses not to go after that quota and has it available to a state that has already caught its quota, because there is such abundance. Then something like this should certainly be available.

CHAIR GARY: Pat Geer.

MR. PAT GEER: I have more of a question. If we approve this today, does that mean it will go out for public comment in the upcoming months, or could that be tabled until after our annual meeting, and we have our discussion about, you know we know what the results of the stock assessment are in October, because I agree, I think the timing on this is not great. As Jay said, I agree on the concept of this, I just think the timing is bad. Can we approve this and put off public comment until a later date, maybe after the annual meeting?

MS. FRANKE: I'm going to turn to Toni.

MS. KERNS: Yes, you can do that. I guess the question is, is the Board comfortable not seeing the document fully fleshed out? Because these are new options that we're adding, it's not all of the exact language that would be in the document. Typically, if we're not rushing something then you would task the PDT to go back, add these options.

Then bring it back to the Board, and consider it for approval for public comment. If we want to do something different, then we would need the Board to spell out what that timeline would be, and how we would bring the fleshed-out document back to the Board. Are you waiving that option?

CHAIR GARY: Did that answer the question, Pat?

MR. GEER: Yes, I believe so.

CHAIR GARY: I think if I have this right, I think we had Nichola and then Eric Reid.

MS. MESERVE: My comment is not as much to the motion, it's more about the timeline. Do you want me to go ahead with that? I definitely support the approach that Toni was suggesting there, that the result of this discussion is so approve this motion, but also allow the PDT some additional time to respond to the concerns that are already raised in the memo, that the size limit issue that Megan raised, the options that Mr. Paquette raised, I think may have been on some of the minds of the PDT members, speaking as one of them.

I think the timeline that I am kind of thinking about was that the PDT get to return with a revised draft document in February might provide enough time to put some focus on the responding to the stock assessment, and then to address this issue, but give us a certain timeline to continue its development, and hopefully approve it then.

CHAIR GARY: Eric.

MR. REID: It wasn't that long ago nobody had any problem taking quota away from the commercial sector for three or four different species. Of course, that's a different action, perhaps those stocks are in better shape. Maybe they're not. Nobody is really sure at this point, because they were all under assessment.

But if you read the motion, the first bullet says the Board will decide if transfers are allowed the next year. The second bullet, if the Board approves. The third bullet, the Board may also choose. It's dumbfounding to me that we're having this conversation about not adding quota, but actually allowing the commercial sector to effectively harvest quota that has been issued to them. I'm fully in support of this motion, and that's it for me. But I find it very hard to swallow if this weren't to move ahead.

CHAIR GARY: I've got Tom Fote and then John Clark, and we're on a pretty short fuse, folks, and I would like to go ahead and call the question after that if we could. Go ahead, Tom.

MR. FOTE: I'm just addressing to Eric's comment. Those were fisheries that when they allocated the quotas were set up unfairly, it penalized the recreational sector, so Eric, you weren't around when those quotas were set up, I was. They weren't fairly treated back then, and we proved it with documentation.

CHAIR GARY: All right, thank you, Tom. To you, John, to finish, and we'll call the question.

MR. CLARK: I just wanted to make sure that by having the Board decide on everything here, I was

fully cognizant of the fact that this Board, if the stock was still overfished and overfishing was occurring, obviously the Board would not approve transfers, you know given that those options in there.

Both Steve and Eric hit on the fact that these fisheries are supplying fish to people that really enjoy eating striped bass, they are important, as has been made clear time and time again in Delaware. I mean we don't want to re-litigate how we ended up with the small quota we did, but I think this is a very practical method to allow for some extra quota to states that can responsibly harvest it.

I just understand the timing issue, and I don't have any problem with this, if this is approved, putting off the actual addendum until everything can be rewritten by the PDT. You know again, I just think it's something that we need to be cognizant of that, and move this along, because there will be a time when it would be really helpful to allow the commercial fishery to get the quota that is allocated to it. Thank you.

CHAIR GARY: We're going to go ahead and call the question. I'm assuming there is going to be a need to caucus, so I'll give you all three minutes and then we'll bring it back. Let's make that two minutes. Okay, let's bring it back for the vote, and before we do so, I would like to turn this back over to Toni for clarification on timelines.

MS. KERNS: Just for clarity on what you're voting on here is that if this motion passes, then these bullets would be tasked to the PDT to add to the draft document. In addition to that we've already had a request from Board members to also address the issues raised in their memo, specifically Megan did bring up the size limit, which was already in the memo.

Then Nichola brought up the issue that Mr. Paquette brought up, which is the overfished status of the stock, which I believe was actually in the original memo as well. The PDT can try to address all of these issues and bring this back to the Board in November, but if there is a workload issue,

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because we did just task the TC with a bunch of items, and we may or may not need a little bit of help from the TC for those things, then they would come back to the Board in November for review for approval for public comment.

CHAIR GARY: Okay, thank you, Toni. We'll go ahead and call the question. All those in favor of this motion, please raise your hand.

MS. KERNS: We have Rhode Island, Massachusetts, Connecticut, New York, New Jersey, NOAA Fisheries, North Carolina, Virginia, D.C., Maryland, Delaware, Maine, New Hampshire and Potomac River Fisheries Commission. Sorry, Pennsylvania.

CHAIR GARY: All those opposed. Abstentions. MS.

KERNS: U.S. Fish and Wildlife Service.

CHAIR GARY: Null votes. Okay, the motion.

MS. FRANKE: We have 15 in favor with 1 abstention.

CHAIR GARY: Emilie is going to provide a clarification on the timeline.

MS. FRANKE: Again, as Toni just stated, the PDT will work to add these options to the document, and address the other concerns raised by the PDT, and we'll aim to bring it back to the Board as soon as possible. Depending on workload that could be in February.

ADJOURNMENT

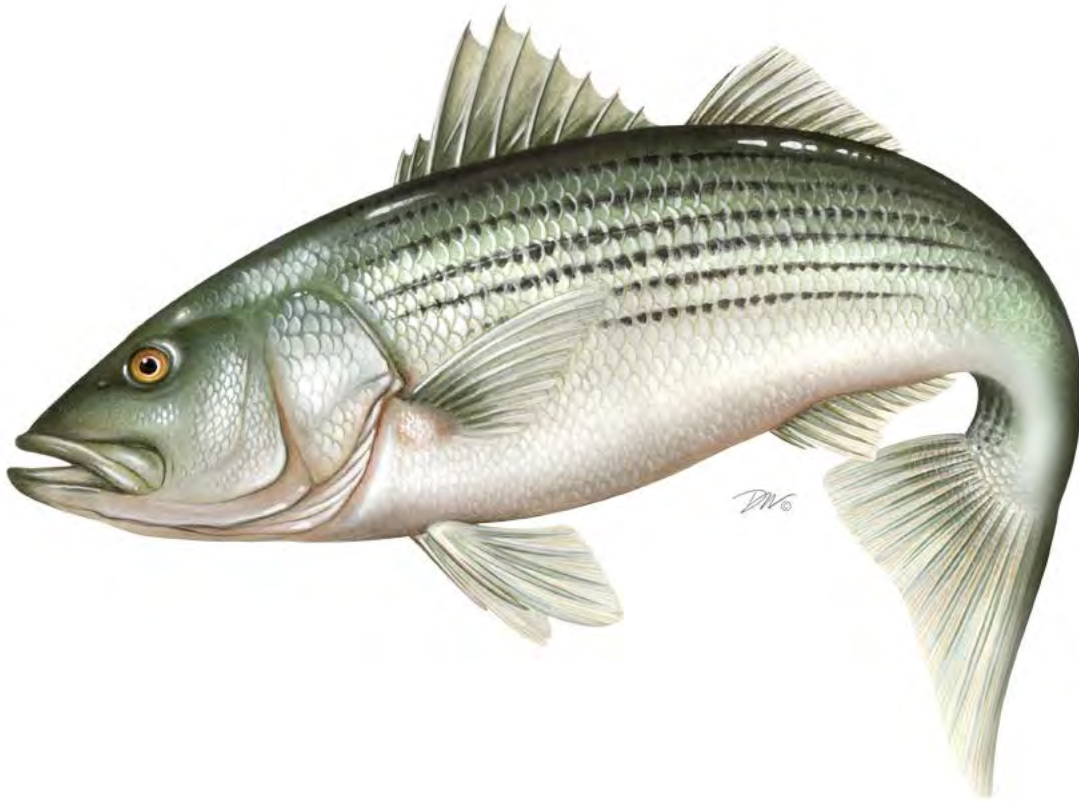
CHAIR GARY: Is there any other business to bring before this Board? Seeing none, I would seek a motion to adjourn. Motion by Dave Sikorski, second by John Clark, thank you. This Board is adjourned.

(Whereupon the meeting adjourned at 5:30 p.m. on
Tuesday, August 2, 2022)

Draft for Board Review

Atlantic States Marine Fisheries Commission

2022 Striped Bass Stock Assessment Update Report



Draft for Board Review
October 2022



Sustainable and Cooperative Management of Atlantic Coastal Fisheries

Draft for Board Review

Atlantic States Marine Fisheries Commission

Striped Bass Stock Assessment Update

Prepared by the

ASMFC Striped Bass Stock Assessment Sub-Committee
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Hank Liao, Virginia Marine Resources Commission
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EXECUTIVE SUMMARY

The time series of striped bass removals and indices from the 2018 benchmark assessment was updated to include data from 2018-2021. Total removals from 2018-2021 averaged 5.37 million fish annually, a 24% decrease from 2017, the terminal year of the last assessment when the stock was experiencing overfishing. From 2018-2021, recreational release mortality made up 50% of total removals, with recreational harvest making up 37%, commercial harvest making up 11%, and commercial discards making up 2% of the total.

COVID-19 affected fishery-dependent and fishery-independent sampling for state surveys and the MRIP dockside intercept program, although the level of impact varied from state to state. The assessment model was able to accommodate the missing index data, but overall, COVID-19 increased uncertainty in the 2020 and 2021 data.

The single-stock statistical catch-at-age (SCA) model was updated through 2021. The model parameterization was the same as in the benchmark assessment, with the exception of a new selectivity block from 2020-2021 in the Bay and Ocean fleets, to account for the regulation changes from Addendum VI. Sensitivity runs were conducted to look at the effect of only including a new selectivity block in the Ocean fleet and the effect of not including any new selectivity blocks.

Because the recruitment trigger in Amendment 7 was tripped in 2021 for the Maryland juvenile abundance index, the biological reference points were updated using the low recruitment regime assumption. This resulted in a lower F target and F threshold compared to the benchmark assessment.

In 2021, the Atlantic striped bass stock was overfished but was not experiencing overfishing. Female spawning stock biomass 2021 was estimated at 64,805 metric tons (143 million pounds) which is below the updated SSB threshold of 85,457 metric tons (188 million pounds), and below the updated SSB target of 106,820 metric tons (235 million pounds). Total fishing mortality in 2021 was estimated at 0.14 which is below the updated F threshold of 0.20 per year, and below the updated F target of 0.17 per year.

The sensitivity run with the new selectivity block for the Ocean fleet only produced very similar results to the base run, while the sensitivity run with no new selectivity blocks produced higher estimates of F and lower estimates of SSB in 2020-2021. However, stock status was the same for all three runs.

The retrospective pattern remained moderate to low in magnitude for the assessment update, but reversed direction compared to the benchmark; the model underestimated F and overestimated SSB in the most recent peels. The retrospective-adjusted estimates of F and SSB were within the 90% confidence intervals of the unadjusted estimates, so correcting for retrospective pattern was not necessary for status determination or projections.

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Projections were run to determine the probability of SSB being at or above the SSB target by 2029, the rebuilding deadline. Under the current F , there is a 78.6% chance the stock will be rebuilt by 2029, indicating a reduction in catch is not necessary at this time.

The sensitivity run with a new selectivity block in the Ocean fleet only produced very similar results to the base model, but the run with no new selectivity blocks was more pessimistic about rebuilding, requiring an 8.6% reduction in removals to have a 50% chance of being at or above the SSB target in 2029. However, there was a greater than 50% chance of being above the SSB threshold by 2029 for all three runs.

	Target	Threshold	2021 Value	Status
Fishing Mortality	0.17	0.20	0.14	Not overfishing
Female SSB	106,820 mt (235 million lbs)	85,457 mt (188 million lbs)	64,805 mt (143 million lbs)	Overfished

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TOR 1. Update fishery-dependent data (landings, discards, catch-at-age, etc.) that were used in the previous peer-reviewed and accepted benchmark stock assessment.

The time series of striped bass recreational and commercial removals from the 2018 benchmark assessment (NEFSC 2019) was updated to include data from 2018-2021. This included recreational harvest, recreational release mortalities, commercial harvest, and commercial discards.

Total removals from 2018-2021 averaged 5.37 million fish annually, a 24% decrease from 2017, the terminal year of the last assessment when the stock was experiencing overfishing (Table 1, Figure 2). Approximately 62% of the removals came from the ocean fleet over that time period, while 38% came from the Chesapeake Bay fleet, consistent with the overall percentages for the whole time series (Table 1, Figure 1).

From 2018-2021, recreational release mortality made up 50% of total removals, with recreational harvest making up 37% and commercial harvest making of 11% of the total (Figure 2). Commercial dead discards made up approximately 2% of the total removals.

COVID-19 had an impact on fishery-dependent data collection during 2020. Biological sampling levels for the recreational and commercial fisheries were reduced, which increased uncertainty somewhat in the catch-at-age for both fisheries. The MRIP effort survey continued uninterrupted, but the Access Point Angler Intercept Survey (APAIS) was suspended for part of 2020. Data from 2018 and 2019 were used to impute total recreational catch rates for 2020 where necessary. Overall, 29% of recreational harvest rate information and 15% of released alive rate information was attributed to imputed catch data for 2020 (Table 2). The percentage of imputed information in 2020 recreational catch rates varied from state to state, depending on the length of time that APAIS was suspended. Although COVID likely affected the overall harvest from the commercial fishery, it did not significantly impact reporting the catch.

The MRIP CPUE index of abundance was updated with data through 2021. The index was developed using the same species associations identified in the previous benchmark. Imputed records were excluded from the intercept data pull for 2020. The index declined somewhat from 2018-2021.

TOR 2. Update fishery-independent data (abundance indices, age-length data, etc.) that were used in the previous peer-reviewed and accepted benchmark stock assessment.

Where possible, the fishery independent age-1+ and recruitment indices used in the most recent benchmark assessment (Table 3) were updated through 2021. Several surveys were impacted by COVID and other issues in the most recent years (Table 4 and Table 5).

The assessment used seven fishery independent indices of age-1+ abundance: the Chesapeake Bay Multispecies Monitoring and Assessment Program (ChesMMAP), the Maryland Spawning Stock Survey (MDSSN), the Delaware Spawning Stock Electrofishing Survey (DESSN), the Delaware 30' Bottom Trawl Survey (DE30), the New York Ocean Haul Seine (NYOHS), the New Jersey Bottom Trawl Survey (NJTRL), and the Connecticut Long Island Sound Trawl Survey (CT

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LISTS). The NJ Trawl did not operate from 2019-2021 due to COVID and vessel issues. ChesMMAAP changed vessels in 2018 and the calibration process has not been finished, so calibrated estimates were not available for 2019-2021 in time for this update. The DE SSN and CT LIST surveys did not operate in 2020 due to COVID. The MD SSN was interrupted for two weeks in 2021 due to COVID. Age-1+ surveys with data through 2021 showed mixed trends, with some surveys increasing since 2017 and some decreasing (Figure 3).

The assessment uses four age-0 juvenile abundance indices (JAI) and two age-1 indices as recruitment indices: the MD, VA, NJ, and NY JAIs and the MD and NY age-1 indices. The MD and VA JAIs were combined into a single composite JAI for Chesapeake Bay using the Conn (2010) method. The NJ JAI was the only survey that did not occur in 2020 due to COVID, although the start of the NY Age-1 survey was delayed. 2018 values indicated a strong year class in most indices, but 2021 was generally low (Figure 4 and Figure 5). The MD JAI tripped the recruitment trigger in 2021, with three consecutive years below the Amendment 7 recruitment threshold.

TOR 3. Tabulate or list the life history information used in the assessment and/or model parameterization (M, age plus group, start year, maturity, sex ratio, etc.) and note any differences (e.g., new selectivity block, revised M value) from benchmark.

Model equations are shown in Appendix 1 Table 1. The model parameterization was the same as used in the benchmark assessment (NEFSC 2019), with the exception of a new selectivity block from 2020-2021 in the Bay and Ocean fleets, to account for the regulation changes from Addendum VI (Table 6). In initial runs, the exponential-logistic and double-logistic selectivity equations were used to explore if the selectivity during 2020-2021 changed to dome-shaped due to changes in size-limits, particularly in the Ocean. Initial results showed that the 2020-2021 selectivity pattern in the Bay remained dome-shaped, and the 2020-2021 selectivity pattern in the Ocean remained flat-topped. Therefore, the exponential-logistic and Gompertz functions were used to model selectivity for 2020-2021.

Re-weighting of survey indices was required with the addition of four years of removal data and missing index data for several surveys. Survey CVs were adjusted to bring the RMSE close to one and effective sample sizes were adjusted once by using the Francis multipliers (Francis 2011). The RMSEs, CV weights and effective samples from the 2018 benchmark and 2022 assessment models are given in Table 2 in Appendix 1. The largest change in CV weight occurred for the NJ Trawl survey, where the correct CV time series was substituted for the incorrect values input in the benchmark.

No changes were made to the life history information used in the assessment (Table 7).

TOR 4. Update accepted model(s) or trend analyses and estimate uncertainty. Include sensitivity runs and retrospective analysis if possible and compare with the benchmark assessment results. Include bridge runs to sequentially document each change from the previously accepted model to the updated model.

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Model Fit

The model fit the observed total catches and catch age compositions of all fleets well (Appendix 2). The model fit the MDYOY (1970-1981) and MD & VA composite indices very well and the MD Age1, NYOHS, and MDSSN poorly. It fit the other indices reasonably well (Appendix 2). The predicted trends matched the observed trends in age composition of survey indices reasonably well for NYOHS, MDSSN, MRIP, CTLIST, and ChesMMAP. The model fit the age composition of NJTrawl, DESSN, and DE30FT survey adequately. Resulting contributions to total likelihood are listed in Table 3 of Appendix 1. Estimates of fully-recruited fishing mortality for each fleet and total fishing mortality, recruitment, parameters of the selectivity functions for the selectivity periods, catchability coefficients for all surveys, and parameters of the survey selectivity functions are given in Table 4 of Appendix 1.

Estimates of the catch selectivity patterns for each fleet showed that, although the patterns varied over time with changes in regulation, selectivity was dome-shaped for Chesapeake Bay and primarily flat-topped for the Ocean over time (Figure 6). There was a steep shift in the descending limb of the selectivity pattern in 2020-2021 for Chesapeake Bay compared to the previous selectivity block, and a shift in the selectivity in 2020-2021 for the Ocean to lower ages (Figure 6).

Fishing Mortality

Fully-recruited annual fishing mortality in 2021 for the Bay and Ocean was 0.05 and 0.10 (Figure 7), and peaked at ages 6 and 10-15, respectively. Total fully-recruited F in 2021 was 0.14 (Table 8, Figure 7) and peaked at age 6. Coefficients of variation indicated region-specific and total fishing mortality estimates were precise (CVs mostly less than 0.20) (Table 4 of Appendix 1).

Recruitment

Recruit numbers increased steadily through 1993 (Figure 8). Large recruitment events occurred in 1994, 1997, 2002, and 2004 as the large Chesapeake Bay 1993, 1996, 2001 and 2003 year-classes became age-1. Average to below-average year-classes were produced during 2004-2010, which resulted in a decline of age-1 numbers. Subsequently, strong year-classes were produced in 2011 and 2015. After 2016, recruit abundance fluctuated slightly and has averaged 123.5 million fish (Table 8, Figure 8). Four of the last five year-classes since 2015 have been below average, although not as low as the levels seen from 2004-2010; the 2018 year-class was above average (Table 8, Figure 8). The below-average 2020 and 2021 recruits will start contributing to SSB in 2027 and 2028 as those fish approach full maturity.

Population Abundance (January 1)

Striped bass abundance (1+) increased steadily from 1982 through 1997 when it peaked around 422.4 million fish (Table 8, Figure 9). Total abundance fluctuated without trend through 2004. From 2005-2009, age 1+ abundance declined to about 181.2 million fish. Thereafter, total abundance peaked in 2012 and 2016 as a result of two large year-classes (2011 and 2015) entering the age-1+ population (Table 8, Figure 9). From 2017-2019, total abundance averaged 243.3 million fish. Abundance declined slightly through 2021 to 218.9 million fish (Figure 9).

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Abundance of striped bass age 8+ increased steadily through 2004 to 16.6 million fish, but then declined to 11.4 million fish through 2010 (Table 8, Figure 9). A small increase in 8+ abundance occurred in 2011 as the 2003 year-class became age 8 (Table 8, Figure 9). Abundance of age 8+ fish declined steadily through 2018 but has increased recently to an average of 6.7 million fish as the 2011 aged recruited to the age-8+ group (Table 8, Figure 9).

Spawning Stock Biomass and Total Biomass

Female SSB grew steadily from 1982 through 2003 when it peaked at about 113,000 metric tons (Table 8, Figure 10). Female SSB declined steadily from 104,749 metric tons in 2010 to 55,120 metric tons in 2018, but in recent years, has steadily increased (Table 8, Figure 10). Estimates of female spawning stock biomass were very precise (CVs less than 0.14; Table 10 of Appendix 1).

Exploitable biomass (January 1) increased from 36,985 metric tons in 1982 to its peak at 333,000 metric tons in 1999 but declined steadily through 2015 (Figure 10). Since 2016, exploitable biomass steadily increased albeit at a slow pace.

Retrospective Analysis

Moderate retrospective patterning (<15%) was evident in the more recent estimates of fully-recruited total F and female SSB (Figure 11). The retrospective pattern suggested that fishing mortality is likely slightly under-estimated (<12%) and female spawning biomass is over-estimated by 5-17%. Recruitment appeared to be over-estimated in most years, although underestimation did occur in a few years (Figure 11). The Mohn's rho values for fishing mortality, female SSB and recruitment were estimated to be -0.087, 0.103 and 0.156, respectively.

The current retrospective trends are different from what was observed in the 2018 benchmark and earlier assessments (NEFSC 2019). The past retrospective patterns showed that female SSB was typically under-estimated and fishing mortality was over-estimated. Exploratory analyses indicated that the change was due, in part, to the addition of new data and changes in index weighting. When the index CV weightings from the 2018 benchmark assessment was used in the current assessment, the past retrospective pattern was reproduced through the 2016 peel and then changed to what is observed currently, albeit at a lower level of percent difference (Appendix 1).

Sensitivity Runs

The NY Age-1 seine survey and MD SSN survey were completed in all years, but the timing of each was affected by the COVID pandemic: the NY Age-1 survey started later than usual in 2020 and the MD SSN survey was suspended for two weeks in 2021. To determine if these potentially biased values influenced the results of the assessment, a run was made in which those index values were coded as missing. Comparison of results (Figure 12) showed that the missing values had little influence on the time series of F and SSB estimates.

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Two additional runs were made to explore the influence of using the new selectivity blocks in 2020-2021. One run was made in which a new 2020-2021 selectivity block was created only for the Ocean region and a second was made in which no new selectivity periods were created. Full results and diagnostics for these sensitivity runs are presented in Appendix 3 and 4.

Comparison of residual plots, particularly for the fleet age composition, showed that the base run produced the smallest residuals in 2020-2021 (Appendices 2-4). Based on Mohn's rho, the base model had the lowest retrospective pattern ($F=-0.087$; $SSB=0.103$) compared to the Ocean only run ($F=-0.094$; $SSB=0.121$) and the no new selectivity blocks run ($F=-0.107$; $SSB=0.177$).

The run with the new selectivity for the Ocean fleet only produced very similar results to the base run, but the run with no new selectivity blocks produced higher estimates of F and lower estimates of SSB in 2020-2021 (Figure 13).

Comparison of Results from the 2018 Benchmark Assessment with 2022 Update Assessment

Fully-recruited fishing mortality and female spawning stock biomass estimates from the update and benchmarks assessments are shown in Figure 14. The updated assessment produced higher estimates of fishing mortality in 2012-2017 and lower estimates of female spawning stock biomass from 1992-2001 and 2012-2017.

TOR 5. Update the biological reference points or trend-based indicators/metrics for the stock. Determine stock status.

The fishing mortality and spawning stock biomass reference points were updated using the same methods as the benchmark assessment (NEFSC 2019). The spawning stock biomass threshold is the 1995 estimate of SSB from the current assessment and the SSB target is 125% of the threshold. Using a stochastic projection drawing recruitment from empirical estimates and a distribution of starting population abundance at age, fishing mortalities associated with the SSB target and threshold were determined. Empirical estimates of recruitment, selectivity, and the starting population came from the SCA model results. The selectivity pattern used in the projections was calculated as the geometric mean of the 2020-2021 total F -at-age, scaled to the highest F -at-age (Figure 15). Estimates of recruitment were restricted to 2008-2021 to represent the "low" recruitment regime. The population was projected for 100 years and fully-recruited F was adjusted until the median of the projected SSB reached the SSB target or threshold.

The updated SSB reference points and associated fishing mortalities are:

$SSB_{\text{threshold}} = 85,457$ metric tons	$F_{\text{threshold}} = 0.20$
$SSB_{\text{target}} = 106,820$ metric tons	$F_{\text{target}} = 0.17$

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Status of the Stock

Before stock status can proceed, analyses must be done to determine if the estimates of F and SSB in 2021 should be corrected for the apparent pattern observed in the retrospective analyses. Here we used the National Marine Fisheries Service standard procedure in which the estimates are adjusted for the retrospective pattern using Mohn's rho values (average of proportion differences over seven-year peels) and then compared to the unadjusted estimates and their associated 90% confidence intervals. If either retrospective-adjusted value falls outside an unadjusted value's 90% confidence intervals, then the retrospective-adjusted values are used. If not, the unadjusted values are sufficient for stock determination. Figure 16 shows a bivariate plot of the unadjusted estimates and their associated 90% confidence interval along with the retrospective-adjusted values. Because the retrospective-adjusted values fall within the 90% confidence intervals, retrospective adjustment is not needed.

In 2021, the Atlantic striped bass stock was overfished but was not experiencing overfishing based on the point estimates of fully-recruited fishing mortality and female spawning stock biomass relative to the reference points defined in this assessment. Female spawning stock biomass in 2021 was estimated at 64,805 metric tons (143 million pounds) which is below the SSB threshold of 85,457 metric tons (188 million pounds), and below the SSB target of 106,820 metric tons (235 million pounds) (Table 9, Figure 17). However, because of error associated with these estimates, there is a 0.9% probability that the 2021 female SSB estimate is above or equal to the SSB threshold and a 0% probability that the 2021 estimate is above the target.

Total fishing mortality in 2021 was estimated at 0.14 which is below the F threshold of 0.20 and the F target of 0.17 (Table 9, Figure 17). There is a 99.6% probability that the 2021 fully-recruited fishing mortality is below the fishing mortality threshold, and a 91% probability that the value is below the F target.

Although the estimate of F in 2021 was higher for the sensitivity run with no new selectivity blocks, stock status was the same for all three sensitivity runs: overfishing was not occurring and the stock was overfished.

TOR 6. Conduct short term projections when appropriate. Discuss assumptions if different from the benchmark and describe alternate runs.

Three scenarios were run to determine when female SSB is expected to reach the SSB target under the "low" recruitment regime. In the first run, the population was projected over ten years assuming the F observed in 2021 (0.14) was the same in 2022-2030. In the second and third runs, the population was projected assuming fishing mortality in 2022-2030 was equal to F associated with the F target and F threshold values. Because the retrospective adjusted values of F and SSB fell within the 90% confidence intervals of the unadjusted estimates, retrospective-adjustment was not needed.

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The projections used the same methods as the benchmark assessment (NEFSC 2019). For each scenario, the model begins in year 2021 with the estimates of January-1 abundance-at-age and associated standard errors from the SCA assessment model. The fully-recruited F estimate and associated standard errors in 2021 ($F=0.14$), selectivity-at-age in 2021, Rivard weights in 2021, natural mortality, female sex proportions-at-age, and female maturity-at-age are used to calculate female SSB as modeled in the SCA model. For 2022, the January-1 abundance-at-age is calculated from the known values of 2021 abundance-at-age, 2021 selectivity and fully-recruited F for 2021. For the remaining years, the January-1 abundance-at-age is projected and is calculated by using the previous year's abundance-at-age, the scenario fully-recruited F , and natural mortality following the standard exponential decay model. Female spawning stock biomass is calculated using the average Rivard weights-at-age from 2017-2021 along with proportion of female by age and maturity-at-age.

For each iteration of the simulation, the abundance and fishing mortality-at-age values in 2021 are randomly drawn from a normal distribution parameterized with the associated standard errors from the SCA assessment model. For the remaining years, abundance of age-1 recruits is randomly drawn from 2008-2021 recruitment estimates. An age-15 plus-group is assumed. For years 2022-2030, selectivity-at-age is assumed equal to the geometric mean selectivity for years 2020-2021. Female spawning stock biomass was calculated by using geometric mean Rivard weight estimates from 2017-2021, sex proportions-at-age, and female maturity-at-age. For each year of the projection, the probability of SSB being above the SSB target and threshold reference points was calculated from 10,000 simulations using function *pgen* in R package *fishmethods*.

Results

Under current fully-recruited fishing mortality ($F=0.14$), female SSB is expected to reach or exceed the SSB threshold by 2023 with a probability of 70.2%, and exceed or reach the SSB target by 2025 with a probability of 56.1% (Table 10, Figure 18). By the rebuilding deadline of 2029, there is a 78.6% chance the stock will be at or above the SSB target and a 96.7% chance the stock will be at or above the SSB threshold. Under F target ($F=0.17$), female SSB is expected to reach or exceed the SSB threshold by 2023 with a probability of 61.9%, and exceed or reach the SSB target by 2028 with a probability of 52.0% (Table 10, Figure 18). Under F threshold ($F=0.20$), female SSB is expected to reach or exceed the SSB threshold by 2023 with a probability of 53.2%, but has a less than 50% probability of reaching the SSB target in any year (Table 10, Figure 18).

The sensitivity run with a new selectivity block in the Ocean fleet only produced very similar results to the base model, but the run with no new selectivity blocks was more pessimistic about rebuilding, with the stock having a less than 20% chance of rebuilding under current F by 2029 (Appendix 4). An 8.6% reduction in removals would be required to have a 50% chance of being at or above the SSB target in 2029 under that model configuration. However, the stock did have a greater than 50% chance of being above the SSB threshold by 2029 in all three runs.

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TOR 7. Comment on research recommendations from the benchmark stock assessment and note which have been addressed or initiated. Indicate which improvements should be made before the stock undergoes a benchmark assessment.

The research recommendations identified in the benchmark assessment (NEFSC 2019) remain relevant, particularly the research recommendations on enhanced collection of life history and biological information including paired scale-otolith samples, migration rates, and sex ratio data. Additional work on refining migration rates and stock composition estimates as well as incorporating tagging data into the spatial statistical catch-at-age model will be required before the next benchmark assessment.

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List of Appendices

Appendix 1: Model structure and detailed results for the base model run.

Appendix 2. Diagnostic plots for the base model in which new 2020-2021 selectivity blocks were added for the Bay and Ocean regions.

Appendix 3. Diagnostic plots and results for a model run in which a new 2020-2021 selectivity block was added for the Ocean region only.

Appendix 4. Diagnostic plots and results from the SCA model with no new selectivity blocks added to the model.

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Tables

Table 1. Total removals by fleet in numbers of fish

Year	Bay Fleet	Ocean Fleet	Total Removals
1982	229,161	677,600	906,761
1983	339,515	709,879	1,049,394
1984	479,009	357,555	836,564
1985	48,686	853,917	902,603
1986	100,649	307,312	407,961
1987	44,939	231,939	276,878
1988	124,365	332,720	457,085
1989	85,092	521,339	606,431
1990	663,884	574,713	1,238,597
1991	790,833	927,478	1,718,311
1992	986,955	1,243,234	2,230,189
1993	941,415	1,088,947	2,030,362
1994	1,326,775	1,585,122	2,911,897
1995	1,978,738	3,049,239	5,027,977
1996	2,514,266	3,749,942	6,264,208
1997	3,166,575	4,214,559	7,381,134
1998	2,949,332	4,961,986	7,911,318
1999	3,195,145	4,867,163	8,062,308
2000	3,432,148	4,955,360	8,387,508
2001	2,586,938	5,184,845	7,771,783
2002	2,673,581	5,513,147	8,186,728
2003	3,333,975	5,528,236	8,862,211
2004	3,327,387	6,195,000	9,522,387
2005	2,971,213	6,137,340	9,108,553
2006	4,083,679	6,983,996	11,067,675
2007	3,162,774	5,132,018	8,294,792
2008	2,630,471	5,592,223	8,222,694
2009	3,151,161	4,880,287	8,031,448
2010	2,936,586	5,433,285	8,369,871
2011	2,520,001	5,037,736	7,557,737
2012	2,671,307	4,411,580	7,082,887
2013	2,752,138	5,754,205	8,506,343
2014	3,231,424	3,839,183	7,070,607
2015	2,788,075	3,315,477	6,103,552
2016	3,589,860	3,601,305	7,191,165
2017	2,495,418	4,553,797	7,049,215
2018	2,367,605	3,420,077	5,787,682
2019	2,114,336	3,344,764	5,459,100
2020	2,006,072	3,080,791	5,086,863
2021	1,633,797	3,510,737	5,144,534

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Table 2. Contribution of imputed data to 2020 MRIP catch rate estimates by state. Imputed data were 2018 and 2019 intercepts that were used to supplement 2020 APAIS data in strata that were under-sampled due to COVID-19.

State	Harvest Rate (A+B1)	Released Alive Rate (B2)
Maine	0%	0%
New Hampshire	15%	7%
Massachusetts	3%	3%
Rhode Island	0%	13%
Connecticut	77%	56%
New York	53%	9%
New Jersey	51%	32%
Delaware	49%	13%
Maryland	9%	7%
Virginia	7%	36%
North Carolina (ocean only)	--	72%
Coastwide	29%	15%

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Table 3. Summary of indices used in the striped bass stock assessment model.

Index Name	Index Metric	Design	Time of		Age
			Year	Years	
MRIP Total Catch Rate Index	Total catch per unit effort	Stratified random	Mar-Dec	1982-2021	1+
Connecticut Long Island Sound Trawl Survey (CTLISTS)	Mean number per tow	Stratified random	Apr-Jun	1984-2021	1+
New York Ocean Haul Seine (NYOHS)	Geometric mean per haul	Fixed station	Sep-Oct	1987-2006	1+
New York Young-of-the-Year (NYYOY)	Geometric mean per haul	Fixed station	Jul-Nov	1985-2021	YOY
New York Western Long Island Beach Seine Survey (NY Age-1)	Geometric mean per haul	Fixed station	May-Aug	1984-2021	1
New Jersey Bottom Trawl Survey (NJTRL)	Stratified mean per tow	Stratified random	April	1990-2018	1+
New Jersey Young-of-the-Year Survey (NJYOY)	Geometric mean per haul	Fixed station	Aug-Oct	1982-2021	YOY
Delaware Spawning Stock Electrofishing Survey (DESSN)	Geometric mean per tow	Fixed station	Apr-Jun	1996-2021	1+
Delaware 30' Bottom Trawl Survey (DE30)	Geometric mean per tow	Fixed station	Nov-Dec	1990-2021	1+
Maryland Spawning Stock Survey (MDSSN)	Selectivity-corrected CPUE	Stratified random	Mar-May	1985-2021	1+
Maryland Young-of-the-Year and Yearlings Surveys (MDYOY and MD Age-1)	Geometric mean per haul	Fixed station	Jul-Sep	1954-2021	0-1
Virginia Young-of-the-Year Survey (VAYOY)	Geometric mean per haul	Fixed station	Jul-Sep	1980-2021	YOY
Chesapeake Bay Multispecies Monitoring and Assessment Program (ChesMMAP)	Stratified mean per tow	Stratified random	Mar-Nov	2002-2018	1+

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Table 4. Status of age-1+ striped bass surveys from 2018-2021. Empty cells indicate the survey occurred without interruption.

Year	CT LISTS	NJ TRL	DE SSN	DE 30'	MD SSN	ChesMMAP
2018						
2019		Did not occur				Unavailable
2020	Did not occur	Did not occur	Did not occur			Unavailable
2021		Did not occur			Delayed	Unavailable

Table 5. Status of striped bass recruitment surveys from 2018-2021. Empty cells indicate the survey occurred without interruption.

Year	NY JAI	NY Age-1	NJ JAI	MD JAI	MD Age-1	VA JAI
2018						
2019						
2020		Interrupted	Did not occur			
2021						

Table 6. Model structure summary for the 2021 striped bass update.

	Value(s)
Years in Model	1982-2021
Size/Age Plus Group	15+
Fleets	2 (Bay and Ocean)
Selectivity blocks	Bay fleet: 1982-1984, 1985-1989, 1990-1995, 1996-2019, 2020-2021 Ocean fleet: 1982-1984, 1985-1989, 1990-1996, 1997-2019, 2020-2021

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Table 7. Striped bass life history information used in the 2021 stock assessment update.

Age	Proportion Mature	Proportion Female	Natural Mortality
1	0	0.53	1.13
2	0	0.56	0.68
3	0	0.56	0.45
4	0.09	0.52	0.33
5	0.32	0.57	0.25
6	0.45	0.65	0.19
7	0.84	0.73	0.15
8	0.89	0.81	0.15
9	1	0.88	0.15
10	1	0.92	0.15
11	1	0.95	0.15
12	1	0.97	0.15
13	1	1	0.15
14	1	1	0.15
15+	1	1	0.15

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Table 8. Population estimates from the 2021 striped bass assessment update.

Year	Full <i>F</i>	Recruitment (millions of age-1 fish)	Female SSB (mt)	Total Abundance (millions of fish)	Age 8+ Abundance (millions of fish)
1982	0.17	36.2	18,498	54.5	1.7
1983	0.14	70.1	15,614	92.4	1.5
1984	0.07	60.5	15,783	95.8	1.3
1985	0.19	66.8	16,452	106.2	1.5
1986	0.05	64.5	14,838	109.0	1.7
1987	0.03	71.2	18,247	118.9	2.0
1988	0.04	92.5	24,125	145.2	2.5
1989	0.05	104.6	36,060	167.5	3.3
1990	0.07	128.3	42,017	201.1	5.3
1991	0.09	100.6	49,377	186.7	6.5
1992	0.11	106.0	62,663	190.7	7.5
1993	0.09	131.1	70,390	217.9	8.0
1994	0.12	285.6	79,213	382.5	8.6
1995	0.21	184.3	85,457	336.1	9.6
1996	0.27	232.1	95,380	378.2	9.9
1997	0.21	261.2	90,227	422.4	10.2
1998	0.22	147.1	83,863	325.8	9.7
1999	0.21	152.1	83,024	304.0	9.3
2000	0.21	121.4	95,101	263.3	9.7
2001	0.20	192.2	99,421	318.3	13.6
2002	0.22	228.7	111,329	369.2	14.1
2003	0.24	118.3	113,506	276.1	15.3
2004	0.26	323.3	109,337	453.8	16.6
2005	0.26	157.0	108,416	340.1	14.5
2006	0.30	138.7	102,105	293.5	13.1
2007	0.23	81.2	99,830	216.9	10.9
2008	0.24	131.8	106,075	240.7	11.6
2009	0.23	70.6	104,599	181.2	12.8
2010	0.27	92.3	104,749	182.0	11.4
2011	0.28	118.3	97,556	203.0	14.5
2012	0.28	208.6	95,936	297.5	12.8
2013	0.39	63.6	84,750	182.7	11.2
2014	0.31	76.9	73,346	162.6	8.1
2015	0.27	152.4	63,415	228.0	7.5
2016	0.31	238.7	64,227	333.0	6.2
2017	0.35	101.7	57,106	231.5	5.6
2018	0.26	130.7	55,120	234.8	5.4
2019	0.23	159.6	56,634	263.7	7.4
2020	0.14	109.5	59,980	223.1	6.4
2021	0.14	116.0	64,805	218.9	6.6

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Table 9. Updated biological reference points and 2021 estimates for *F* and female SSB compared with the estimates from the 2018 benchmark.

Metric	2018		2021		2021 Value
	2018 Target	Threshold	2021 Target	Threshold	
Fishing Mortality	0.20	0.24	0.17	0.20	0.14
Female SSB	114,295 mt (252 million lbs)	91,436 mt (202 million lbs)	106,820 mt (235 million lbs)	85,457 mt (188 million lbs)	64,805 mt (143 million lbs)

Table 10. Probability of SSB being at or above the SSB threshold or target under different constant *F* scenarios. Shaded row indicates 2029, the rebuilding deadline.

Year	Probability SSB ≥ SSB threshold under current <i>F</i>	Probability SSB ≥ SSB target under current <i>F</i>	Probability SSB ≥ SSB threshold under <i>F</i> target	Probability SSB ≥ SSB target under <i>F</i> target	Probability SSB ≥ SSB threshold under <i>F</i> threshold	Probability SSB ≥ SSB target under <i>F</i> threshold
2021	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2022	34.4%	0.4%	34.5%	0.4%	34.5%	0.4%
2023	70.2%	14.9%	61.9%	13.1%	53.2%	11.6%
2024	86.0%	39.0%	74.1%	29.2%	61.8%	23.2%
2025	91.8%	56.1%	79.3%	40.3%	64.3%	28.6%
2026	94.1%	65.7%	81.4%	45.5%	63.4%	30.3%
2027	95.7%	72.7%	82.8%	49.9%	63.4%	31.9%
2028	96.4%	76.6%	82.8%	52.0%	61.7%	31.6%
2029	96.7%	78.6%	82.4%	52.5%	59.4%	30.5%
2030	97.0%	80.6%	82.8%	53.7%	58.6%	30.5%

Figures

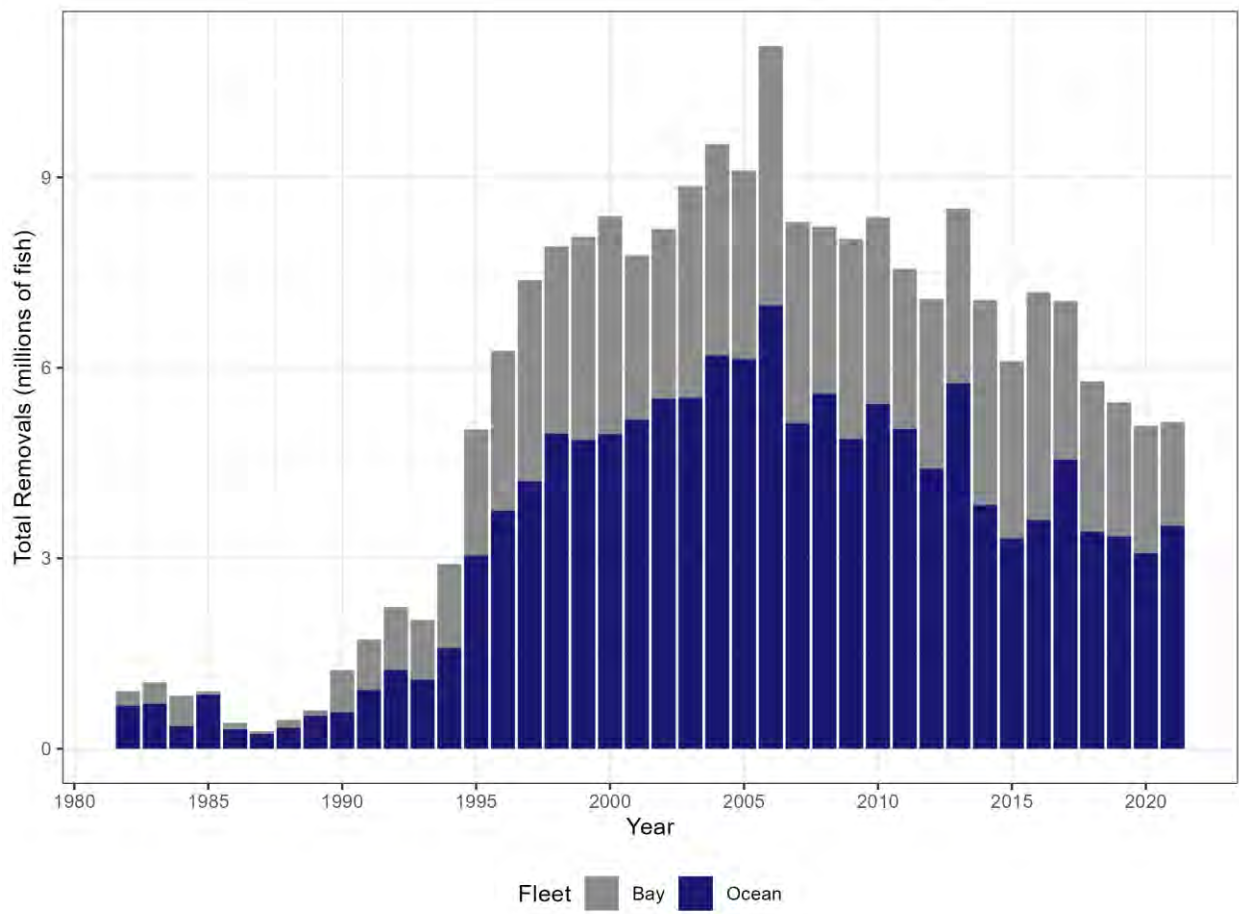


Figure 1. Total striped bass removals by fleet.

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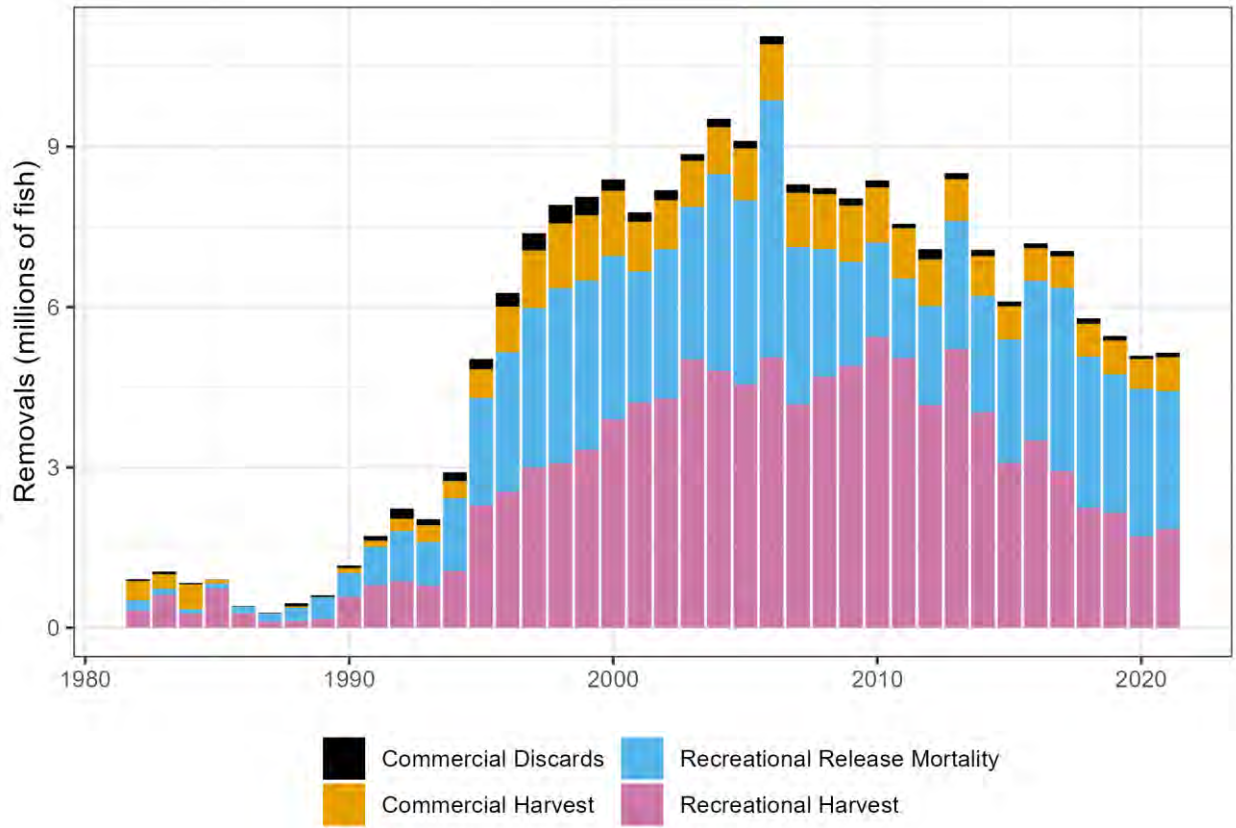


Figure 2. Total striped bass removal by sector.

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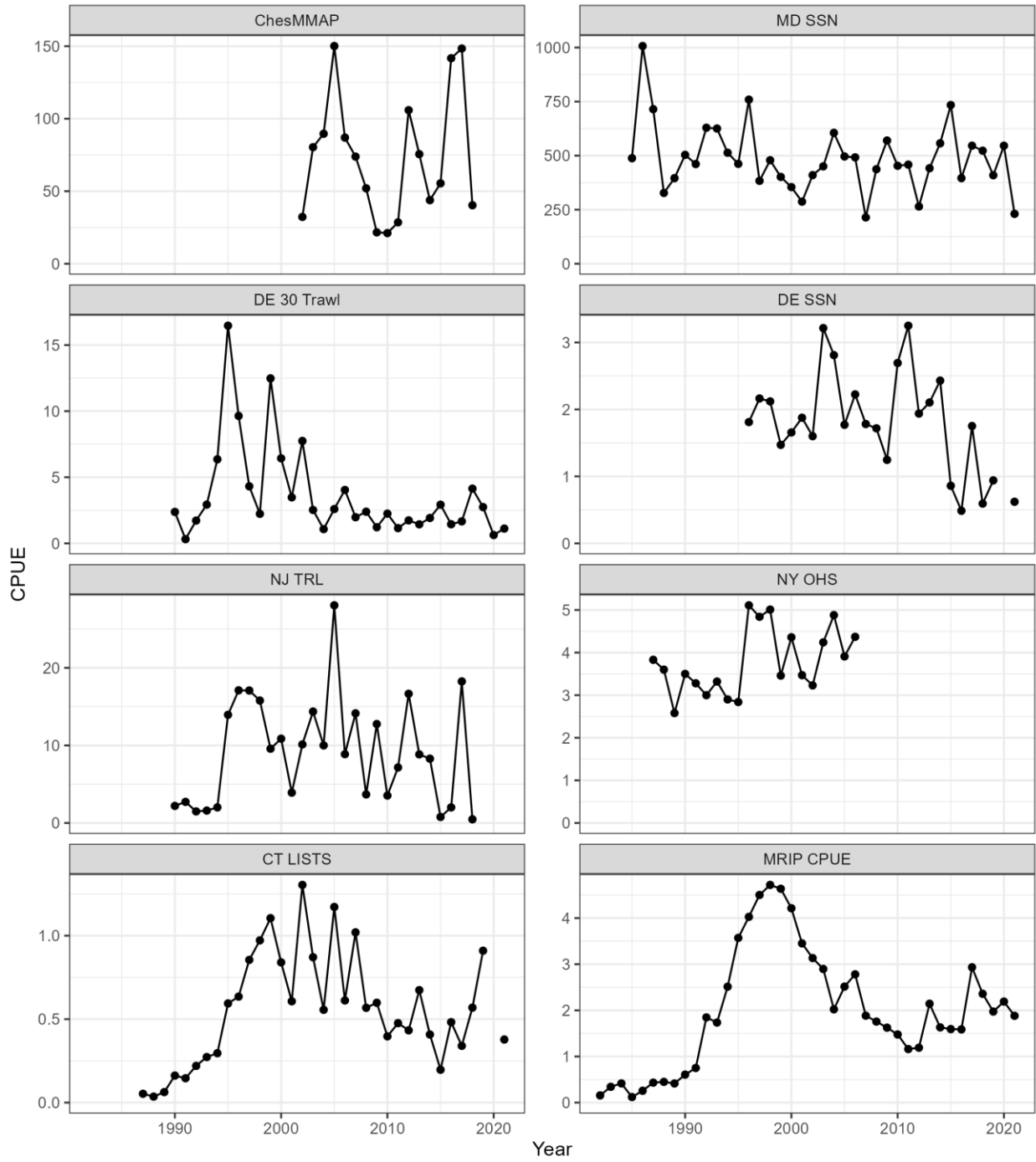


Figure 3. Indices of age-1+ abundance for striped bass, 1982-2021.

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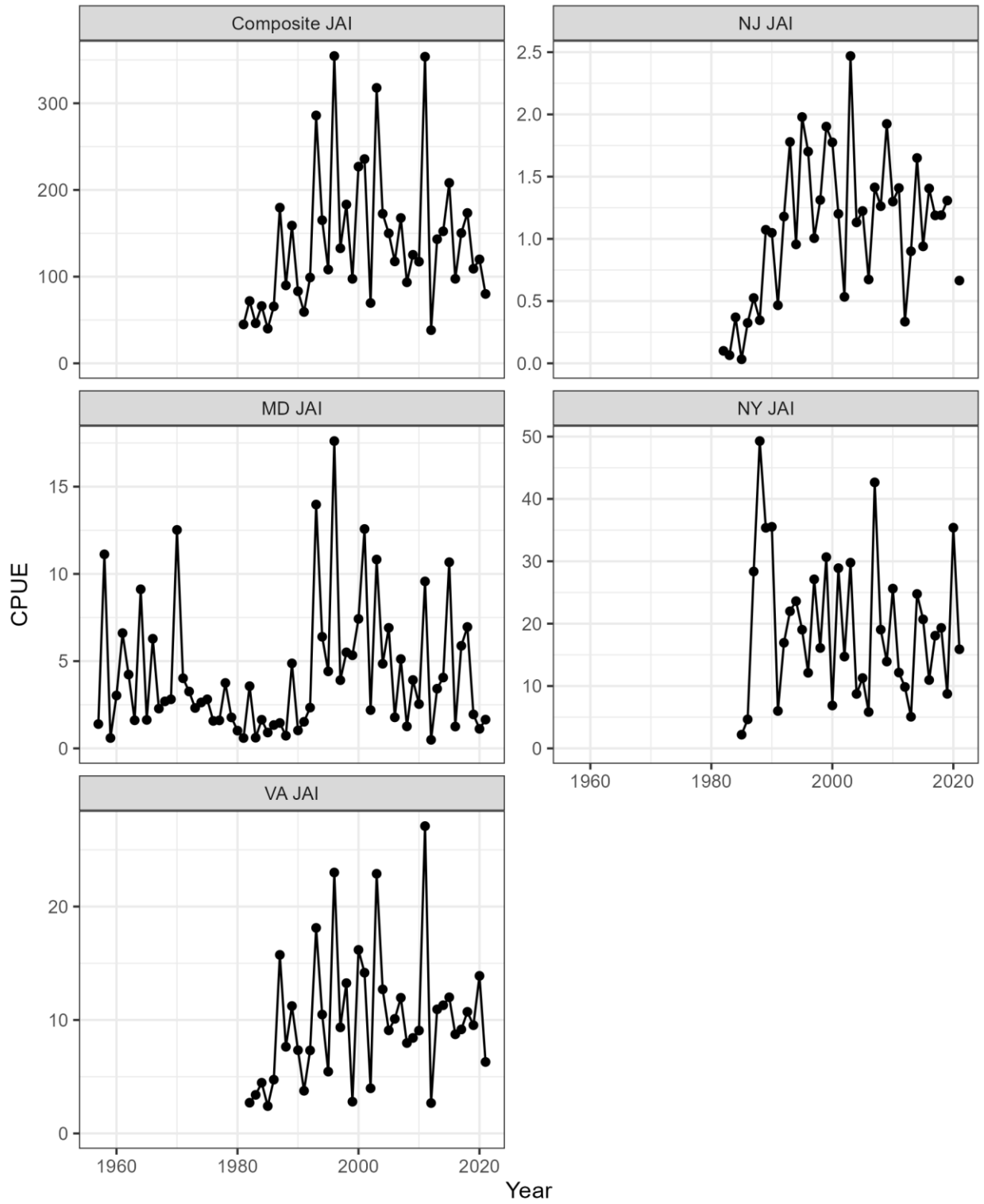


Figure 4. Striped bass juvenile abundance indices, including the composite Chesapeake Bay index (MD-VA), 1954-2021.

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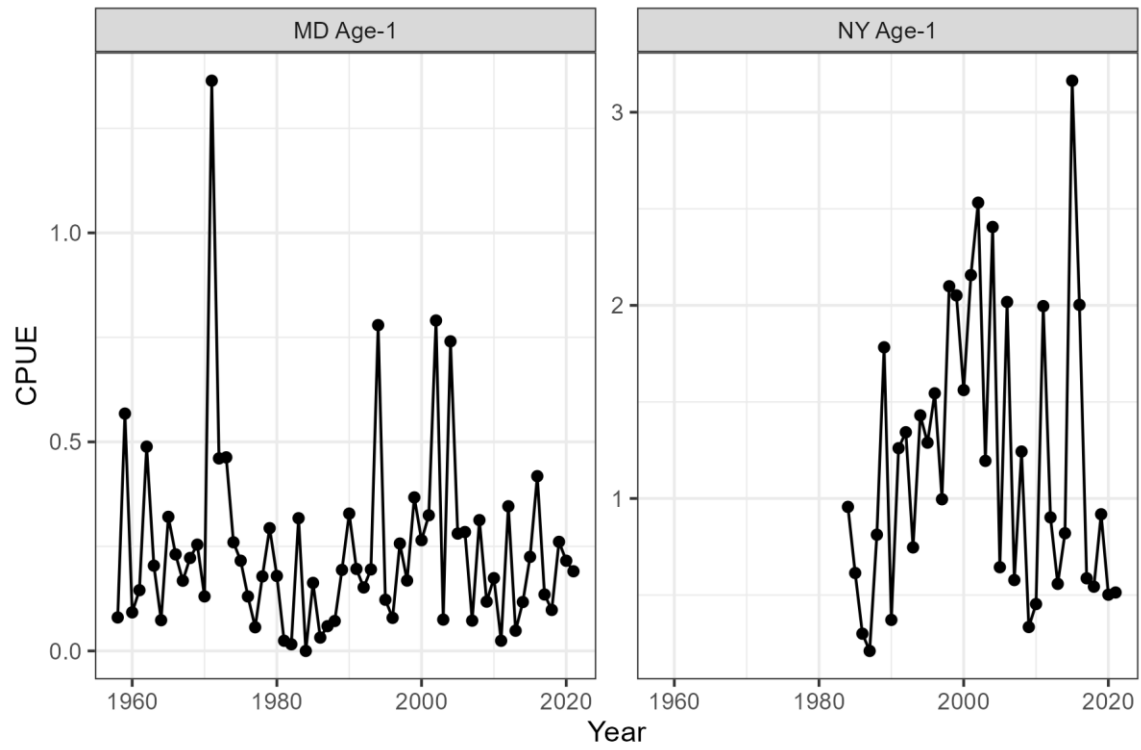


Figure 5. Age-1 recruitment indices for striped bass, 1954-2021.

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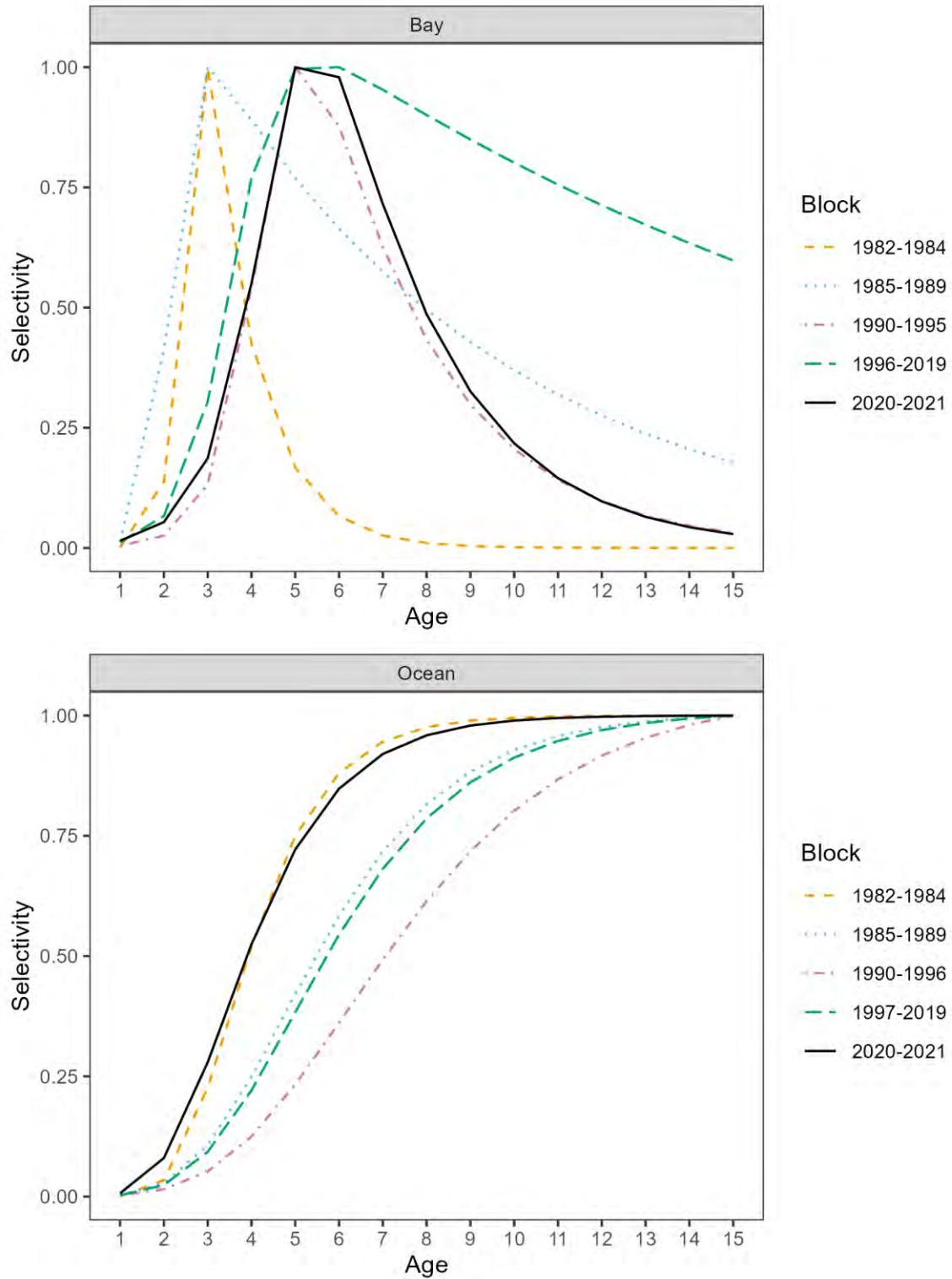


Figure 6. Selectivity patterns for the Bay fleet (top) and the Ocean fleet (bottom).

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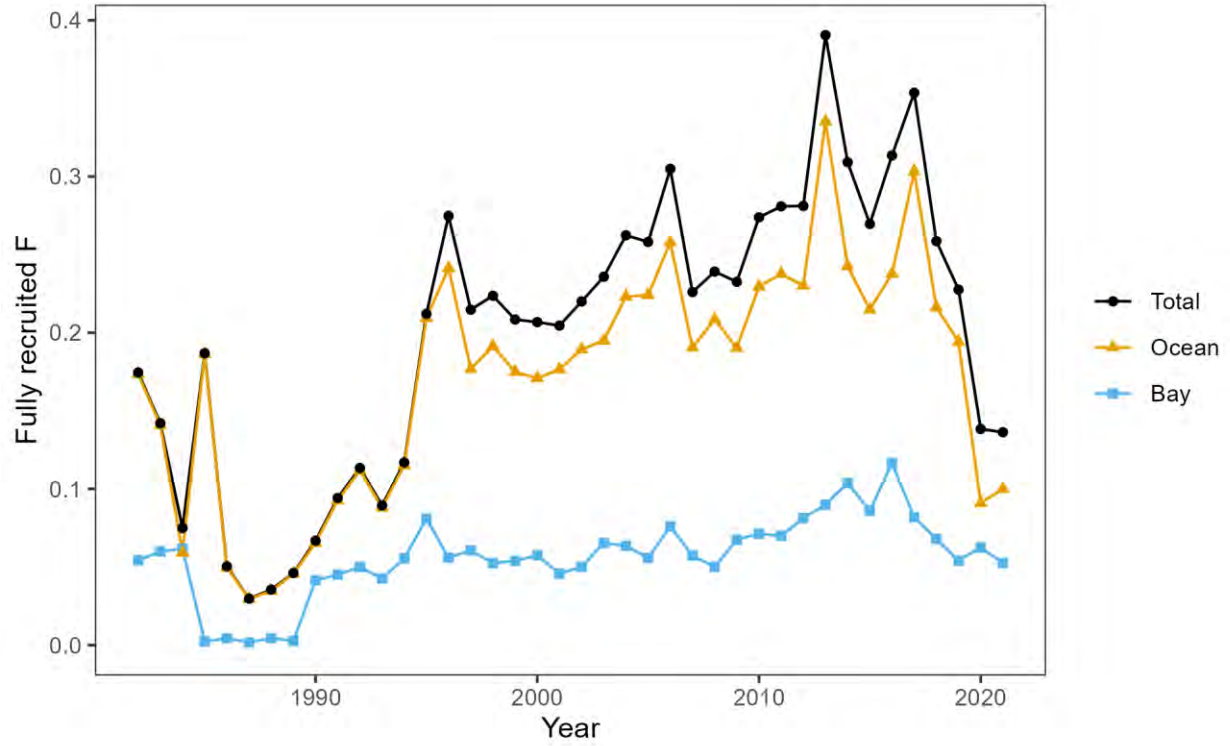


Figure 7. Fully recruited fishing mortality for the Bay and Ocean fleets plotted with the total fully recruited F .

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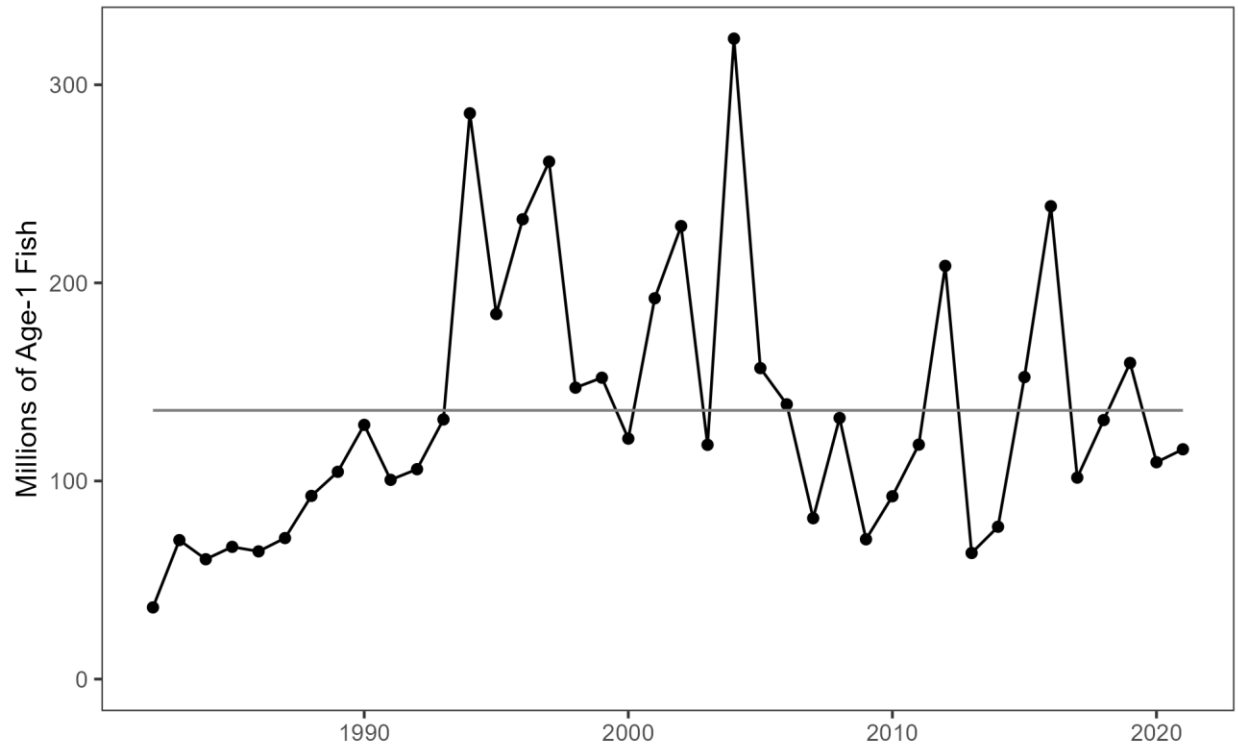


Figure 8. Estimates of striped bass recruitment plotted with the time series mean.

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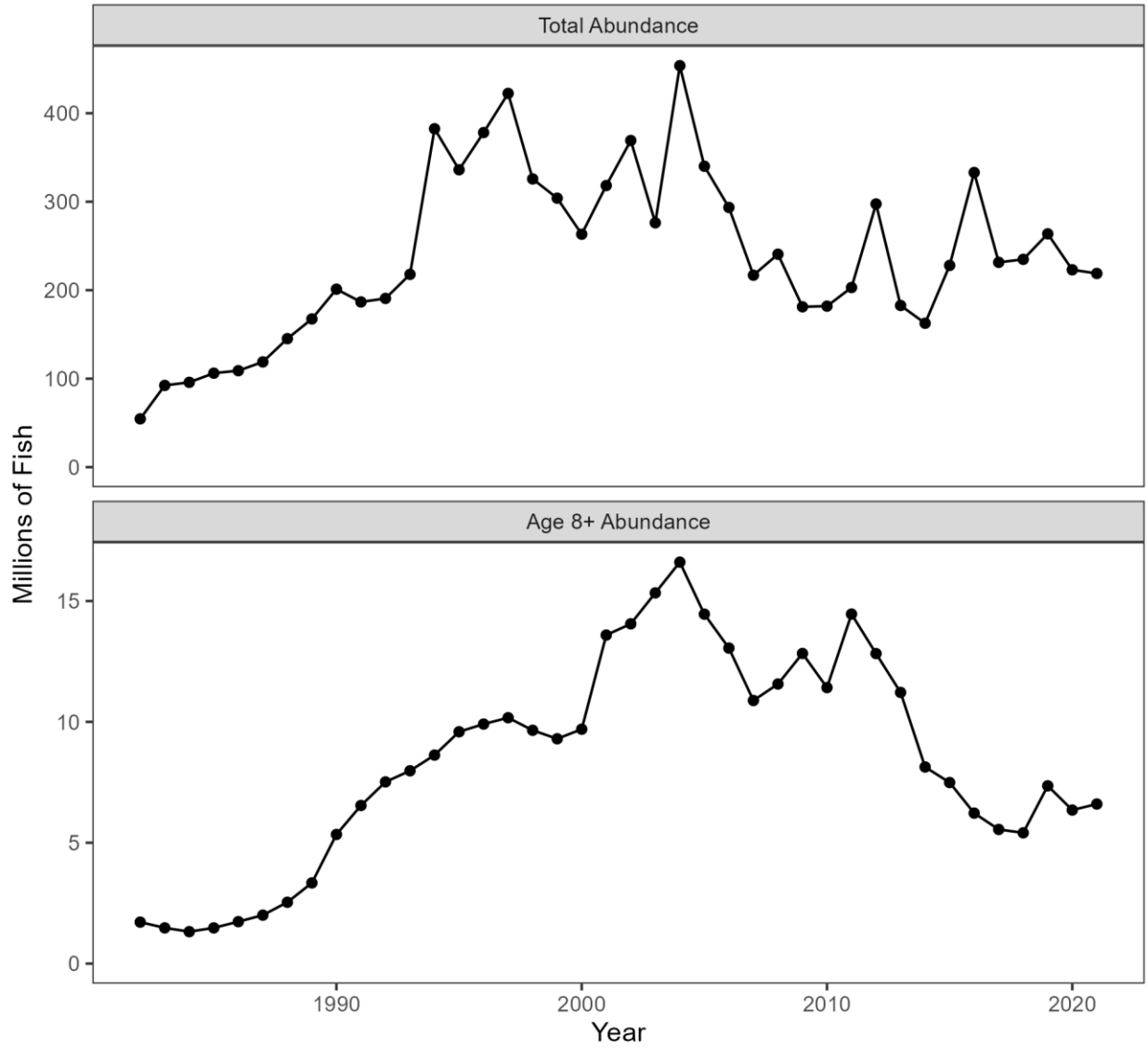


Figure 9. Total abundance (top) and age-8+ abundance of striped bass over time.

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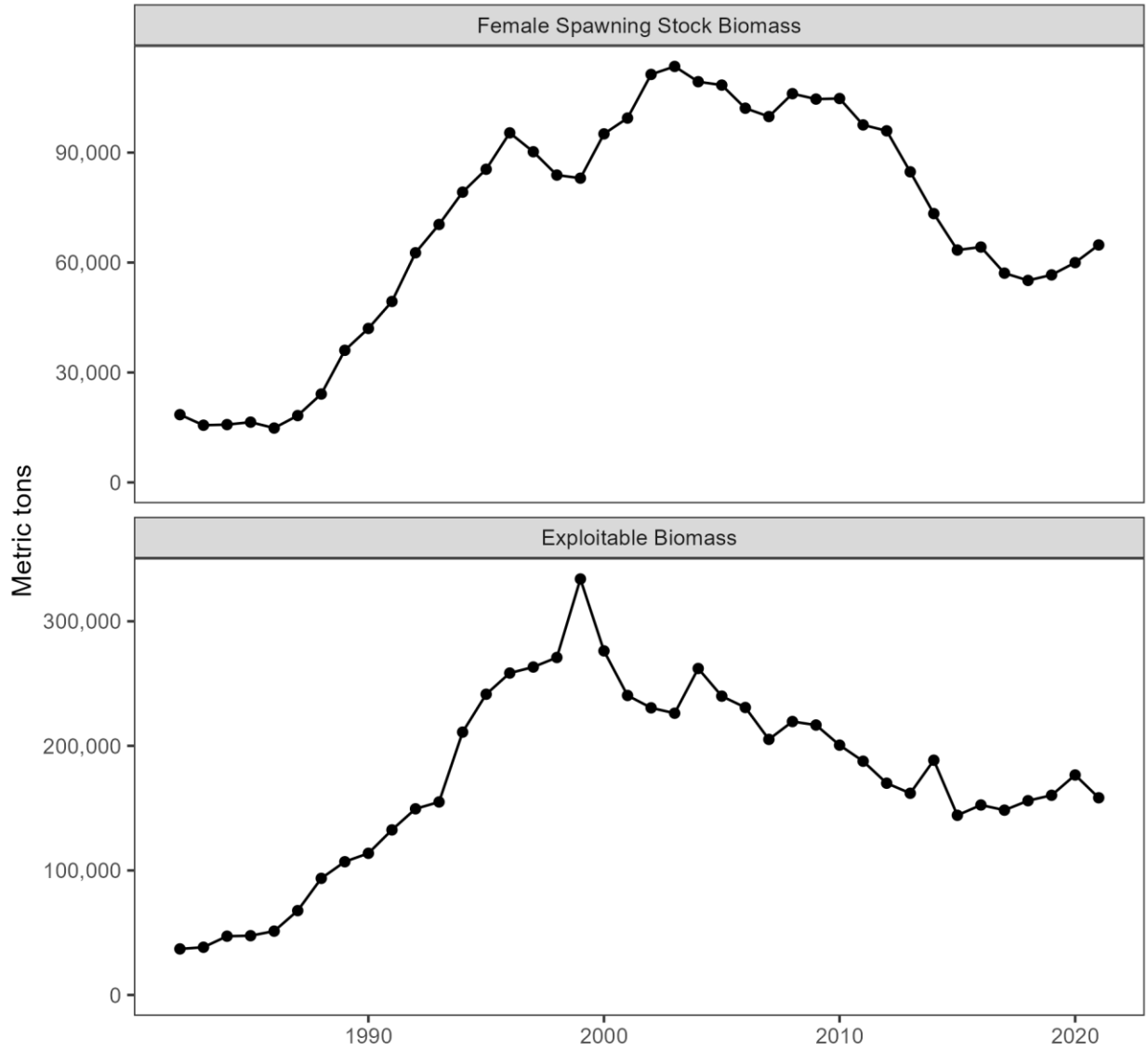


Figure 10. Female spawning stock biomass (top) and exploitable biomass of striped bass over time.

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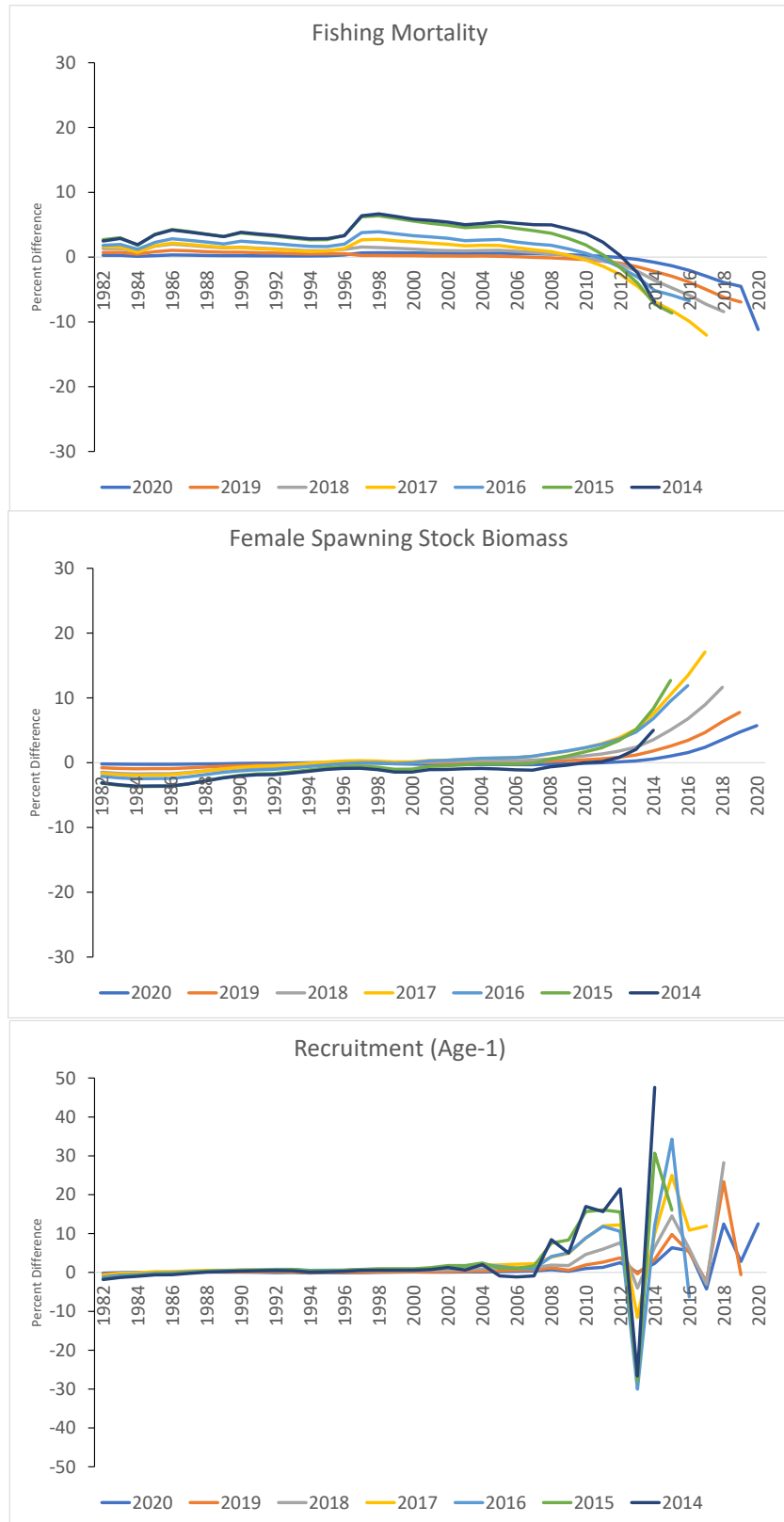


Figure 11. Retrospective plots of seven-year peels for fishing mortality (top), female spawning stock biomass (middle), and recruitment (bottom).

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Figure 12. Comparison of fishing mortality (top), female SSB (middle), and recruitment (bottom) estimates from the update assessment and an assessment in which the 2020 NY Age 1 and 2021 MDSSN index values were set as missing. Absolute values are on the left and relative percent difference is on the right.

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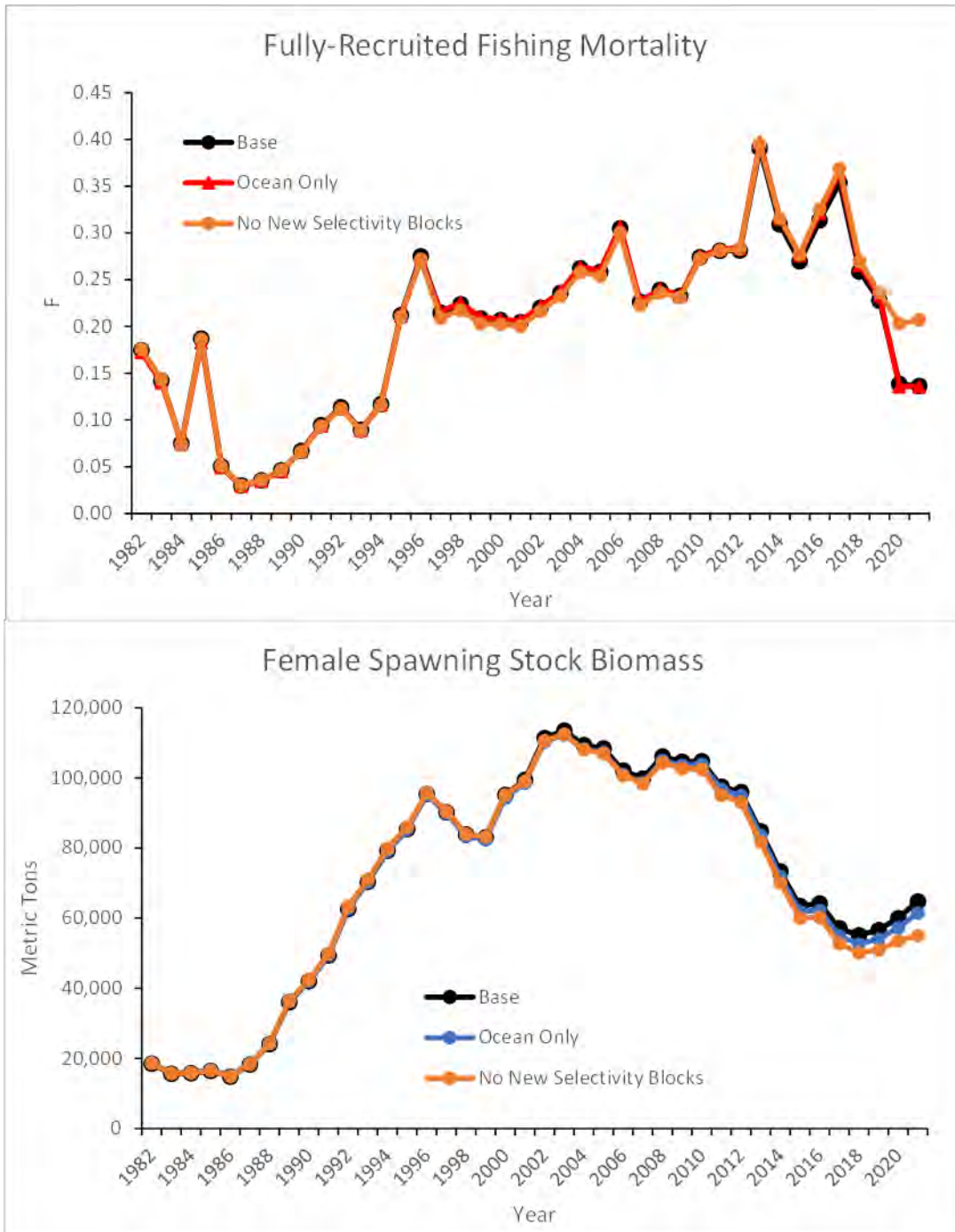


Figure 13. Comparison of fully-recruited fishing mortality (top) and female SSB (bottom) from the update assessment base model and sensitivity runs with a new 2020-2021 selectivity block for the Ocean region only and no new selectivity blocks.

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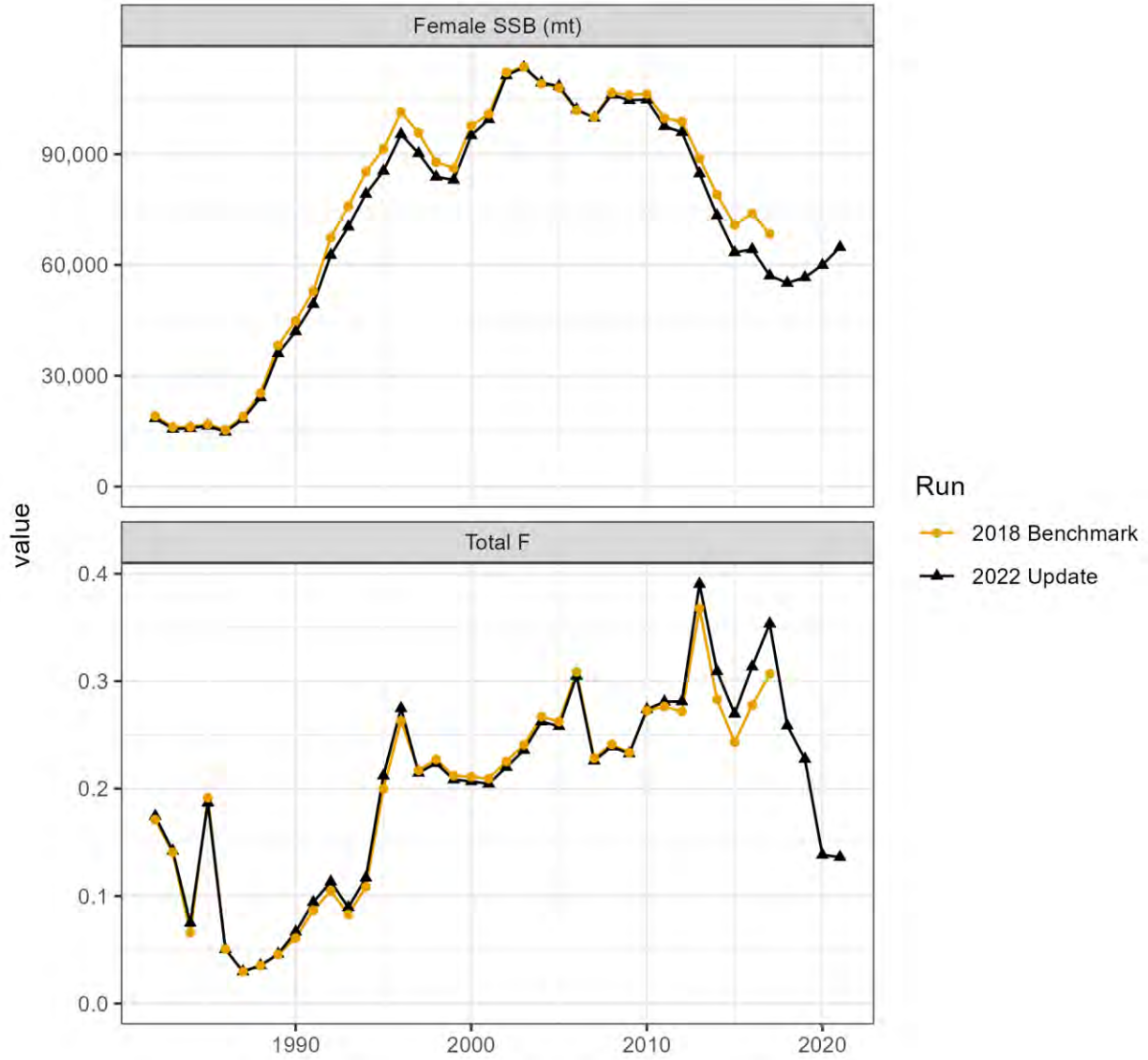


Figure 14. Comparison of estimates of female spawning stock biomass (top) and total fishing mortality (bottom) from the 2018 benchmark assessment and current assessment update.

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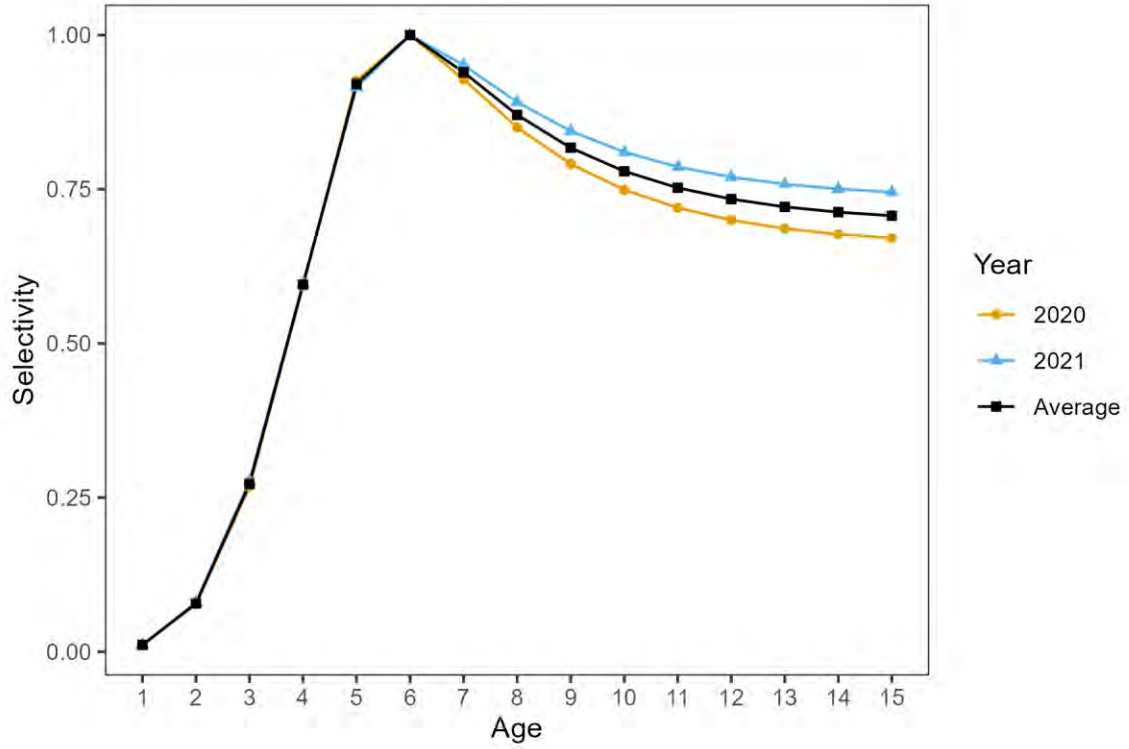


Figure 15. 2020-2021 average selectivity pattern used in the projections to determine fishing mortalities associated with the SSB threshold and targets compared to the overall selectivity in each individual year.

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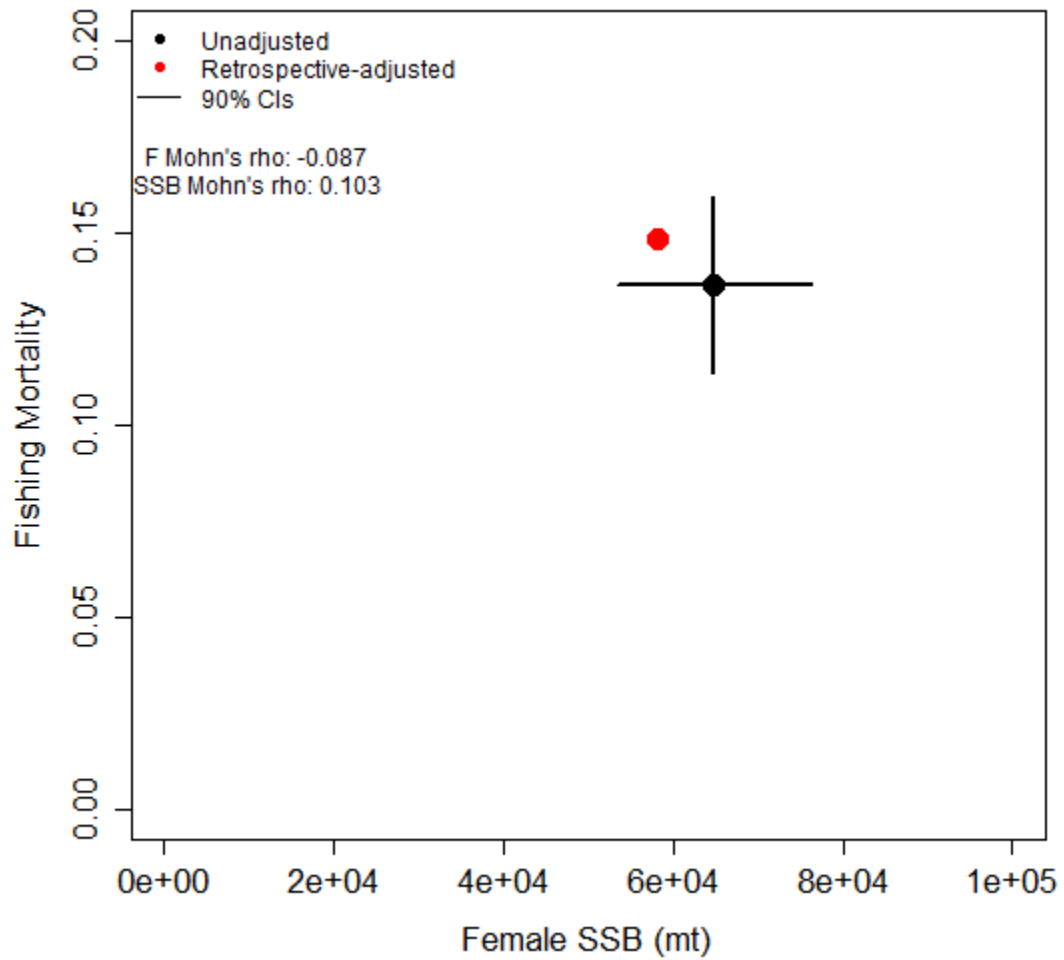


Figure 16. Plot comparing the 2021 retrospective-adjusted F and female SSB values with the unadjusted F and SSB estimates and their associated 90% confidence intervals.

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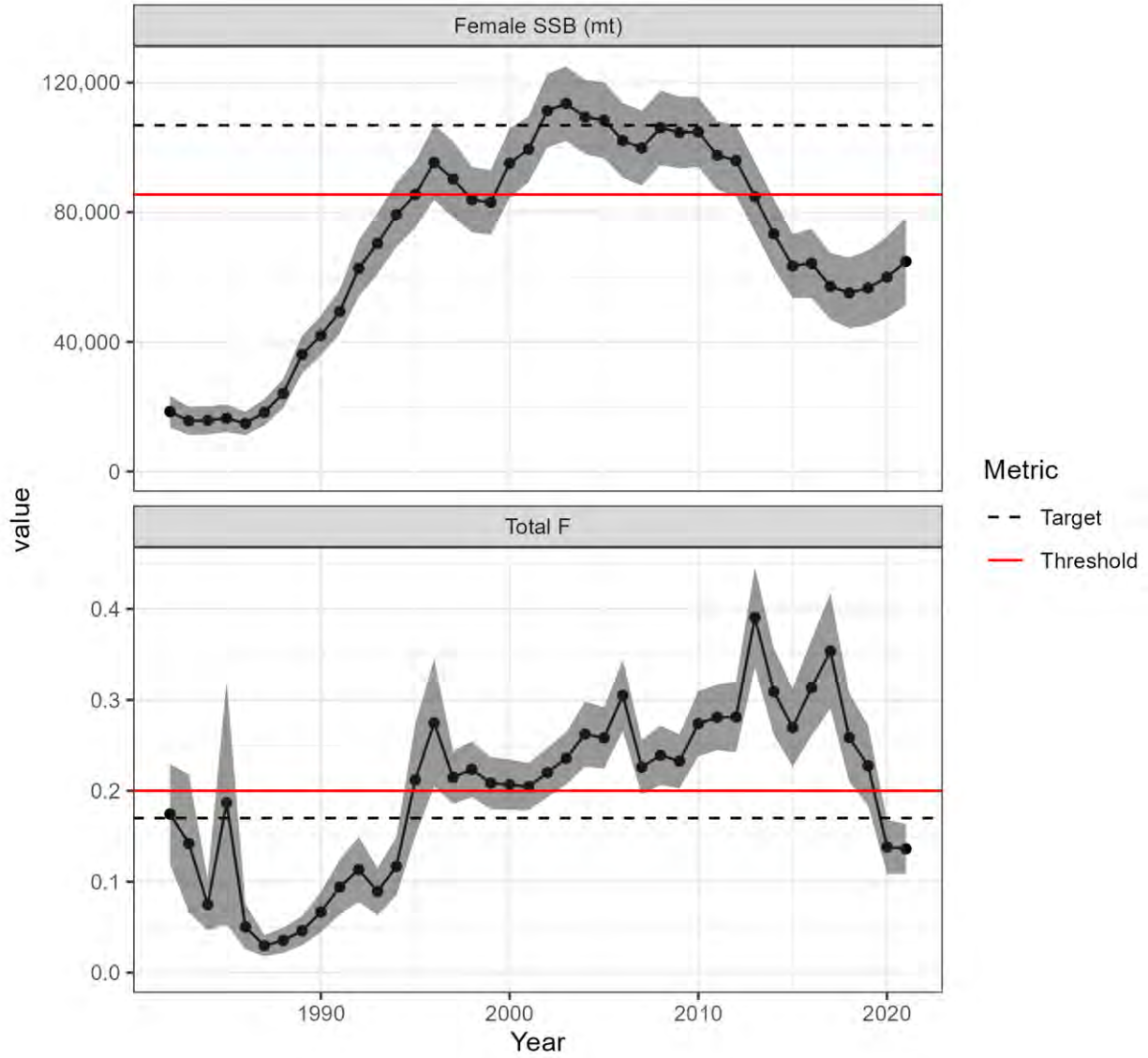


Figure 17. Female SSB (top) and total F estimates (bottom) plotted with their respective targets and thresholds. Shaded area indicates 95% confidence intervals of the estimates.

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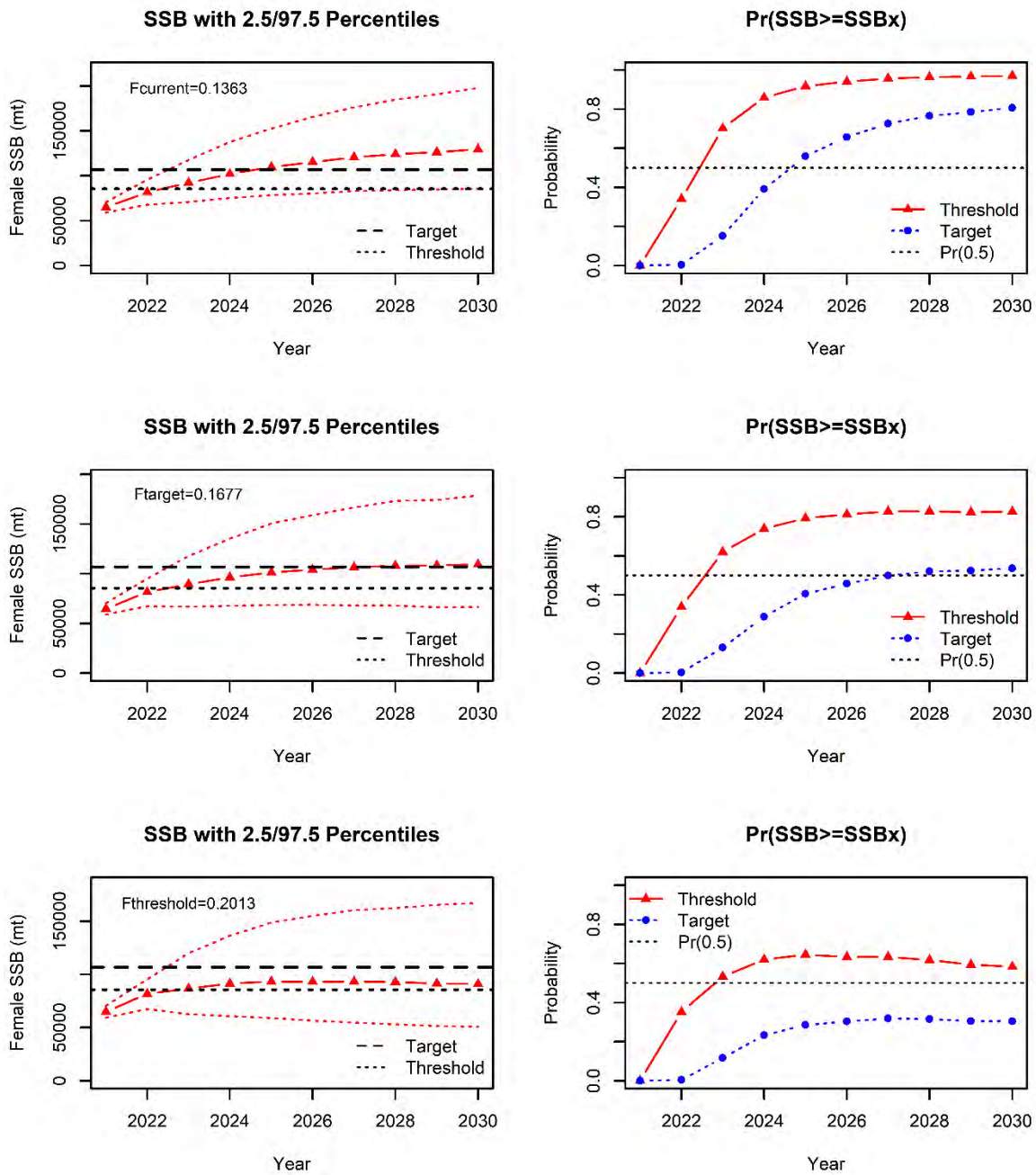


Figure 18. Projections of female spawning stock biomass through 2030 under current F (top), target F (middle), and threshold F (bottom). Absolute values are on the left and the probability of female SSB being above the target and threshold values is on the right.

Appendix 1: Model structure and detailed results for the base model run.

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Table 1. Model structure, equation, and data inputs used in this assessment.

General Definitions	Symbol	Description/Definition
Year Index	y	$y = \{1982, \dots, 2021\}$ for catch. $y = \{1970, \dots, 2021\}$ for indices.
Age Index	a	$a = \{1, \dots, 15+\}$
Fleet Index	f	$f = \{1: \text{Chesapeake Bay}, 2: \text{Coast}\}$
Indices Index:	t	$t = \{1, \dots, 14\}$
Input Data	Symbol	Description/Definition
Observed Fleet Catch	$C_{f,y}$	Reported number of striped bass killed each year (y) by fleet (f)
Coefficient of Variation for Fleets	$CV_{f,y}$	Calculated from MRIP harvest and releases estimates with associated proportional standard errors (commercial harvest from census – no error)
Observed Fleet Age Compositions	$P_{f,y,a}$	Proportion-at-age (a) for each year (y) and fleet (f)
Observed Total Indices of Relative Abundance	$I_{t,y}$	Reported by various states. YOY and Age 1 Indices: 6 Indices with Age Composition: 8 (one fisheries-dependent, 7 fishery-independent)
Coefficient of Variation for Indices	$CV_{t,y}$	Calculated from indices and associated standard errors
Observed Age Compositions of Indices of Relative Abundance	$P_{t,y,a}$	Proportion-at-age (a) for each year (y) and index (t)
Effective Sample Size	\hat{n}	<u>Starting Values from 2018 Benchmark</u> Fleets: Bay – 68.4, Ocean – 71 Indices: NYOHS – 21.4, NJ Trawl – 5.2, MDSSN – 16.8, DESSN – 19.7, MRIP – 35.6, CTLIST – 12.4, DE30FT – 7.3, ChesMap – 10.7 The multiplier from equation 1.8 method of Francis (2011) is used to adjust the starting values.

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Table 1 (cont.)

Population Model	Symbol	Equation
Age-1 numbers	$\hat{N}_{y,1}$	$\hat{N}_{y,1} = \bar{N}_1 e^{\varepsilon_y - 0.5\sigma_R^2}$ $\hat{\sigma}_R = \sqrt{\frac{\sum_y (\hat{\varepsilon}_y - \bar{\varepsilon})^2}{n-1}}$ <p>where ε_y are independent and identically distributed normal random variables with zero mean and constant variance and are constrained to sum to zero over all years</p>
Abundance-at-Age	$\hat{N}_{y,a}$	<p>First year (ages 2-A in 1970): $\hat{N}_{y,a} = \hat{N}_{y,a-1} \exp^{-\hat{F}_{1982,a-1} - M_{1982,a-1}}$</p> <p>Rest of years (ages 2-15): $\hat{N}_{y,a} = \hat{N}_{y-1,a-1} \exp^{-\hat{F}_{y-1,a-1} - M_{y-1,a-1}}$</p>
Plus-group abundance-at-age	$\hat{N}_{y,A}$	$\hat{N}_{y,A} = \hat{N}_{y-1,A-1} \exp^{-\hat{F}_{y-1,A-1} - M_{y-1,A-1}} + \hat{N}_{y-1,A} \exp^{-\hat{F}_{y-1,A} - M_{y-1,A}}$
Fishing Mortality	$\hat{F}_{f,y,a}$	$\hat{F}_{f,y,a} = \hat{F}_{f,y} \cdot \hat{s}_{f,a}$ <p>where F_{fy} and $s_{f,a}$ are estimated parameters</p>
Total Mortality	$\hat{Z}_{y,a}$	$Z_{y,a} = F_{y,a} + M_{y,a}$
Fleet Selectivity Time Blocks and Selectivity Equations	$\hat{s}_{f,a}$	<p>Fleet 1 (Chesapeake Bay): 1982-1984, 1985-1989, 1990-1995, 1996-2019, 2020-2021</p> $\hat{s}_a = \frac{1}{1-\hat{\gamma}} \cdot \left(\frac{1-\hat{\gamma}}{\hat{\gamma}} \right)^{\hat{\gamma}} \frac{\exp^{\hat{\alpha}\hat{\gamma}(\hat{\beta}-a)}}{1+\exp^{\hat{\alpha}(\hat{\beta}-a)}}$ <p>Fleet 2 (Ocean): 1982-1984, 1985-1989, 1990-1996, 1997-2019, 2020-2021</p> $\hat{s}_a = \exp^{-\exp^{-\hat{\beta}(a-\hat{\alpha})}}$
Predicted Catch-At-Age	$\hat{C}_{f,y,a}$	$\hat{C}_{f,y,a} = \frac{\hat{F}_{f,y,a}}{\hat{F}_{f,y,a} + M_{y,a}} \cdot (1 - \exp^{-\hat{F}_{y,a} - M_{y,a}}) \cdot \hat{N}_{y,a}$

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Table 1 (cont.)

Population Model	Symbol	Equation
Predicted Total Catch	$\hat{C}_{f,y}$	$\hat{C}_{f,y} = \sum_a \hat{C}_{f,y,a}$
Predicted Proportions of Catch-At-Age	$\hat{P}_{f,y,a}$	$\hat{P}_{f,y,a} = \frac{\hat{C}_{f,y,a}}{\sum_a \hat{C}_{f,y,a}}$
Predicted Aggregated Indices of Relative Abundance	$\hat{I}_{t,y,\Sigma a}$	$\hat{I}_{t,y,\Sigma a} = \hat{q}_t \cdot \sum_a \hat{N}_{y,a} \cdot \exp^{-p_t \cdot Z_{y,a}}$ where q_t is the estimated catchability coefficient of index t and p_t is the fraction of the year when the survey takes place.
Predicted Age-Specific Indices of Relative Abundance	$\hat{I}_{t,y,a}$	$\hat{I}_{t,y,a} = \hat{q}_t \cdot \hat{s}_{t,a} \cdot \hat{N}_{y,a} \cdot \exp^{-p_t \cdot Z_{y,a}}$ where $\hat{s}_{t,a}$ is the selectivity-at-age a for index t
Predicted Total Indices of Relative Abundance with Age Composition Data	$\hat{I}_{t,y}$	$\hat{I}_{t,y} = \hat{q}_t \sum_a \hat{s}_{t,a} \cdot \hat{N}_{y,a} \cdot \exp^{-p_t \cdot Z_{y,a}}$
Predicted Age Composition of Survey	$\hat{U}_{t,y,a}$	$\hat{U}_{t,y,a} = \frac{\hat{I}_{t,y,a}}{\sum_a \hat{I}_{t,y,a}}$
Female Spawning Stock Biomass (metric tons)	SSB_y	$SSB_y = \sum_{a=1}^A N_{y,a} \cdot sr_a \cdot m_a \cdot w_{y,a} / 1000$ where sr_a is the female sex ratio at age a and m_a is female maturity at age a .

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Table 1 (cont.)

Likelihood	Symbol	Equation
Concentrated Lognormal Likelihood for Fleet Catch (F) and Indices of Relative Abundance (T)	$-L_F; -L_T$	$-L_F = 0.5 * \sum_f n_f * \ln \left(\frac{\sum_f RSS_f}{\sum_f n_f} \right)$ $-L_T = 0.5 * \sum_t n_t * \ln \left(\frac{\sum_t RSS_t}{\sum_t n_t} \right)$ <p>where</p> $RSS_f = \lambda_f \sum_y \left(\frac{\ln(C_{f,y} + 0.00001) - \ln(\hat{C}_{f,y} + 0.00001)}{\delta_f \cdot CV_{f,y}} \right)^2$ $RSS_t = \lambda_t \sum_y \left(\frac{\ln(I_{t,y} + 0.00001) - \ln(\hat{I}_{t,y} + 0.00001)}{\delta_t \cdot CV_{t,y}} \right)^2$ <p>\ln is the natural log. $CV_{f,y}$ and $CV_{t,y}$ are the annual coefficient of variation for the observed total catch (f) and index (t) in year y, δ_f and δ_t is the CV weights for total catch f and index t, and λ_t and λ_f are relative weights.</p>
Multinomial fleet catch (FC) and index (TC) age compositions	$-L_{FC}; -L_{TC}$	$-L_{FC} = \lambda_f \sum_y -n_{f,y} \sum_a P_{f,y,a} \cdot \ln(\hat{P}_{f,y,a} + 0.0000001)$ $-L_{TC} = \lambda_t \sum_y -n_{t,y} \sum_a U_{t,y,a} \cdot \ln(\hat{U}_{t,y,a} + 0.0000001)$ <p>where λ_f and λ_t are a user-defined weighting factors and n_y are the effective sample sizes.</p>
Constraints Added To Total Likelihood	$P_{n1}, P_{rdev}, P_{fadd}$	$P_{n1} = \lambda_{n1} (\hat{N}_{y,1} - N_{y,1}^e)^2 \quad \text{- forces } N_{1,1} \text{ to follow S-R curve}$ $P_{rdev} = \lambda_R \sum_y \log_e(\hat{\sigma}_R) + \frac{\hat{\epsilon}_y^2}{2\hat{\sigma}_R^2} \quad \text{- for bias correction to constrain deviations}$ $P_{fadd} = \begin{cases} \text{phase} < 3, & 10 \cdot \sum_y (F_{f,y} - 0.15)^2 \\ \text{phase} \geq 3, & 0.000001 \cdot \sum_y (F_{f,y} - 0.15)^2 \end{cases} \quad \text{- avoid small F values at start}$

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Table 1 (cont.)

Diagnostics	Symbol	Equation
Standardized residuals (lognormal – catch and surveys)	$r_{f,y}$ or $r_{t,y}$	$r_{t,y} = \frac{\ln I_{t,y} - \widehat{\ln} I_{t,y}}{\sqrt{\ln((\delta_t CV_{t,y})^2 + 1)}}$ $r_{f,y} = \frac{\ln C_{f,y} - \widehat{\ln} C_{f,y}}{\sqrt{\ln(CV_{f,y}^2 + 1)}}$
Standardized residuals (age compositions – catch and surveys)	$ra_{f,y,a}$ or $ra_{t,y,a}$	$ra_{f,y,a} = \frac{P_{f,y,a} - \hat{P}_{f,y,a}}{\sqrt{\frac{\hat{P}_{f,y,a}(1 - \hat{P}_{f,y,a})}{\hat{n}_f}}}$ $ra_{t,y,a} = \frac{P_{t,y,a} - \hat{P}_{t,y,a}}{\sqrt{\frac{\hat{P}_{t,y,a}(1 - \hat{P}_{t,y,a})}{\hat{n}_t}}}$
Root mean square error	$RMSE$	<p>Total catch</p> $RMSE_f = \sqrt{\frac{\sum r_{f,y}^2}{n_f}}$ <p>Index</p> $RMSE_t = \sqrt{\frac{\sum r_{t,y}^2}{n_t}}$

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Table 2. Comparison of RMSE, CV weights and effective sample sizes from the 2018 benchmark and 2022 update assessments.

2018 Benchmark					2022 Update Assessment				
Index	n	RMSE	CV Weight	Effective Sample Size	Index	n	RMSE	CV Weight	Effective Sample Size
NYYOY	32	0.99623	3.03		NYYOY	36	0.990985	2.97	
NJYOY	35	0.989621	1.75		NJYOY	38	1.00901	1.73	
MDYOY	12	1.04199	2.10		MDYOY	12	1.00507	2.11	
compos	36	1.01178	0.98		compos	40	1.00575	0.96	
NYAge1	33	1.01612	3.13		NYAge1	37	1.00193	1.19	
MDAge1	48	1.03659	3.32		MDAge1	52	0.998121	3.25	
NYOHS	20	1.0349	2.38	21.48	NYOHS	20	0.996071	2.65	21.80
NJTRAWL	28	1.01072	24.00	5.20	NJTRAWL	29	1.00117	2.95	5.66
MDSSN	33	1.02561	2.40	16.79	MDSSN	37	0.998646	2.50	14.95
DESSN	21	1.00789	0.95	19.70	DESSN	24	1.00934	1.17	18.55
MRIP	36	0.98235	0.97	35.58	MRIP	40	1.00898	2.27	29.64
CTLIST	31	0.987111	1.60	12.41	CTLIST	34	0.996705	3.00	12.93
DE30FT	17	0.994321	0.91	7.33	DE30FT	21	1.00132	0.85	5.81
ChesMP	16	1.00057	2.85	10.76	ChesMP	17	1.00111	2.45	15.10

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Table 3. Summary of likelihood component values.

	Likelihood Weight	RSS
Fleet 1 Total Catch:	2	0.198243
Fleet 2 Total Catch:	2	1.63939
Aggregate Abundance Indices		
NYYOY	1	28.0077
NJYOY	1	30.684
MDYOY	1	10.3223
Compos	1	38.5644
NYAge1	1	32.3038
MDAge1	1	24.3656
Age Comp Abundance Indices		
NYOHS	1	18.801
NJTRAWL	1	20.5932
MDSSN	1	31.1497
DESSN	1	22.2464
MRIP	1	36.0733
CTLIST	1	27.1241
DE30FT	1	17.3121
ChesMap	1	14.7808
Total RSS		354.166
No. of Obs		517
Conc. Likel.		-97.7846
Age Composition Data Likelihood		
Fleet 1 Age Comp:	1	5244.92
Fleet 2 Age Comp:	1	7223.16
NYOHS	1	726.071
NJTRAWL	1	308.944
MDSSN	1	1130.86
DESSN	1	1024.38
MRIP	1	2537.37
CTLIST	1	816.295
DE30FT	1	230.031
ChesMap	1	397.76
Recr Devs :	1	42.5514
Total Likelihood :		19515
AIC :		39412.1

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Table 4. Estimates of Bay and Ocean fully-recruited fishing mortality and total fully-recruited fishing mortality with associated standard errors.

Year	Bay			Ocean			Total		
	Fully-recruited F	SD	CV	Fully-recruited F	SD	CV	Fully-recruited F	SD	CV
1982	0.054	0.013	0.244	0.173	0.003	0.017	0.175	0.028	0.161
1983	0.060	0.028	0.466	0.141	0.013	0.089	0.142	0.039	0.272
1984	0.062	0.008	0.122	0.059	0.004	0.060	0.075	0.015	0.194
1985	0.002	0.038	16.224	0.186	0.013	0.069	0.187	0.068	0.364
1986	0.004	0.014	3.251	0.050	0.004	0.076	0.050	0.013	0.250
1987	0.002	0.011	6.511	0.029	0.017	0.576	0.030	0.006	0.200
1988	0.004	0.000	0.090	0.035	0.004	0.113	0.036	0.007	0.200
1989	0.003	0.068	25.687	0.046	0.016	0.351	0.046	0.008	0.178
1990	0.041	0.001	0.035	0.065	0.005	0.072	0.067	0.011	0.168
1991	0.045	0.013	0.278	0.093	0.018	0.197	0.094	0.015	0.164
1992	0.050	0.000	0.009	0.112	0.004	0.034	0.113	0.018	0.161
1993	0.043	0.006	0.139	0.088	0.014	0.157	0.089	0.013	0.148
1994	0.055	0.001	0.017	0.115	0.003	0.026	0.117	0.016	0.140
1995	0.081	0.007	0.087	0.209	0.015	0.073	0.212	0.032	0.149
1996	0.056	0.001	0.011	0.241	0.004	0.017	0.275	0.036	0.130
1997	0.061	0.008	0.135	0.177	0.013	0.075	0.215	0.015	0.069
1998	0.052	0.006	0.109	0.191	0.007	0.035	0.224	0.016	0.070
1999	0.054	0.011	0.205	0.175	0.016	0.093	0.208	0.015	0.070
2000	0.057	0.007	0.128	0.171	0.005	0.027	0.207	0.014	0.068
2001	0.046	0.015	0.334	0.177	0.017	0.094	0.205	0.013	0.065
2002	0.050	0.005	0.107	0.189	0.007	0.035	0.220	0.014	0.063
2003	0.065	0.018	0.276	0.195	0.017	0.088	0.236	0.015	0.063
2004	0.063	0.004	0.065	0.223	0.006	0.026	0.262	0.018	0.070
2005	0.056	0.013	0.235	0.224	0.026	0.115	0.258	0.017	0.067
2006	0.076	0.005	0.064	0.258	0.009	0.034	0.305	0.020	0.066
2007	0.057	0.016	0.282	0.190	0.021	0.111	0.226	0.015	0.068
2008	0.050	0.007	0.136	0.209	0.006	0.031	0.239	0.017	0.070
2009	0.067	0.031	0.465	0.190	0.019	0.102	0.233	0.015	0.065
2010	0.071	0.004	0.053	0.230	0.010	0.042	0.274	0.018	0.067
2011	0.070	0.034	0.493	0.238	0.023	0.095	0.281	0.018	0.066
2012	0.081	0.004	0.043	0.230	0.007	0.032	0.281	0.020	0.070
2013	0.090	0.013	0.143	0.335	0.029	0.088	0.391	0.028	0.072
2014	0.104	0.003	0.029	0.243	0.006	0.024	0.309	0.024	0.078
2015	0.086	0.014	0.167	0.215	0.022	0.103	0.270	0.022	0.082
2016	0.117	0.003	0.025	0.238	0.004	0.019	0.314	0.027	0.086
2017	0.082	0.013	0.160	0.303	0.020	0.067	0.354	0.032	0.092
2018	0.068	0.003	0.050	0.216	0.007	0.033	0.259	0.025	0.096
2019	0.054	0.012	0.230	0.194	0.016	0.084	0.228	0.023	0.099
2020	0.062	0.002	0.039	0.091	0.007	0.072	0.138	0.015	0.109
2021	0.053	0.012	0.231	0.100	0.017	0.172	0.136	0.014	0.103

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Table 4 cont.

Year	Recruitment	SD	CV
1982	36,189,600	3,415,330	0.094
1983	70,145,300	5,542,010	0.079
1984	60,501,600	4,742,270	0.078
1985	66,752,800	4,951,110	0.074
1986	64,466,700	4,809,840	0.075
1987	71,185,100	5,141,690	0.072
1988	92,479,400	6,290,120	0.068
1989	104,639,000	7,046,020	0.067
1990	128,332,000	8,206,210	0.064
1991	100,577,000	7,316,250	0.073
1992	105,956,000	7,799,400	0.074
1993	131,057,000	8,985,700	0.069
1994	285,603,000	14,309,000	0.050
1995	184,270,000	11,209,300	0.061
1996	232,110,000	12,916,600	0.056
1997	261,208,000	13,616,500	0.052
1998	147,107,000	9,796,390	0.067
1999	152,132,000	9,786,470	0.064
2000	121,379,000	8,726,180	0.072
2001	192,224,000	10,957,900	0.057
2002	228,677,000	11,909,800	0.052
2003	118,255,000	8,247,380	0.070
2004	323,301,000	13,987,900	0.043
2005	156,979,000	9,376,400	0.060
2006	138,701,000	8,611,040	0.062
2007	81,206,600	6,223,450	0.077
2008	131,795,000	8,033,860	0.061
2009	70,564,800	5,605,470	0.079
2010	92,287,300	6,652,580	0.072
2011	118,345,000	7,876,950	0.067
2012	208,585,000	11,831,700	0.057
2013	63,645,900	5,833,940	0.092
2014	76,900,600	6,625,860	0.086
2015	152,439,000	11,679,900	0.077
2016	238,696,000	18,299,700	0.077
2017	101,690,000	10,165,500	0.100
2018	130,745,000	13,613,800	0.104
2019	159,592,000	18,174,900	0.114
2020	109,463,000	15,540,500	0.142
2021	116,007,000	24,287,000	0.209

Catch Selectivity Parameters

	Bay			Ocean		
	Estimate	SD	CV	Estimate	SD	CV
1982-1984				1982-1984		
α	-5.448	0.215	0.04	α	3.484	0.194
β	2.541	0.046	0.02	β	0.820	0.086
γ	0.829	0.022	0.03	1985-1989		
1985-1989				α	4.713	0.383
α	-4.103	0.442	0.11	β	0.473	0.051
β	2.155	0.073	0.03	1990-1996		
γ	0.964	0.012	0.01	α	6.186	0.508
1990-1995				β	0.345	0.034
α	-2.062	0.110	0.05	1997-2019		
β	4.456	0.203	0.05	α	4.932	0.170
γ	0.819	0.035	0.04	β	0.450	0.022
1996-2019				2020-2021		
α	-1.820	0.072	0.04	α	3.358	0.384
β	3.597	0.094	0.03	β	0.682	0.127
γ	0.968	0.010	0.01			
2020-2021						
α	-1.689	0.159	0.09			
β	4.735	0.140	0.03			
γ	0.761	0.073	0.10			

Survey Selectivity Parameters			
	Estimate	SD	CV
NYOHS			
α	-3.03	0.51	0.17
β	2.62	0.15	0.06
γ	0.92	0.03	0.03
NJ Trawl			
α	1.63	0.55	0.34
β	0.26	0.12	0.45
MDSSN			
s ₂	0.13	0.02	0.16
DE SSN			
α	3.96	0.28	0.07
β	0.59	0.08	0.14
MRIP			
α	2.56	0.07	0.03
β	1.08	0.06	0.06
CTLIST			
α	-2.83	0.29	0.10
β	2.16	0.12	0.05
γ	0.96	0.01	0.01
DE30FT			
α	-1.246	0.983	0.79
β	1.290	0.813	0.63
γ	0.938	0.102	0.11
ChesMap			
α	-2.56	0.42	0.16
β	1.77	0.20	0.11
γ	0.91	0.03	0.03

Catchability Coefficients			
Survey	Estimate	SD	CV
NYYOY	1.24E-07	1.29E-08	0.10
NJYOY	8.37E-09	5.61E-10	0.07
MDYOY	1.35E-07	2.27E-08	0.17
compos	1.05E-06	4.75E-08	0.05
NYAge1	2.55E-08	1.95E-09	0.08
MDAge1	9.00E-09	1.58E-09	0.18
NYOHS	8.97E-08	8.47E-09	0.09
NJTRAWL	1.02E-07	1.68E-08	0.16
MDSSN	7.94E-08	7.16E-09	0.09
DESSN	4.90E-08	6.41E-09	0.13
MRIP	4.31E-08	2.96E-09	0.07
CTLIST	7.98E-09	6.76E-10	0.08
DE30FT	2.76E-08	5.01E-09	0.18
ChesMap	7.69E-07	9.90E-08	0.13

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Table 5. Bay Fishing Mortality-At-Age, 1982-2021.

Year	Age														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15+
1982	0.0001	0.0075	0.0542	0.0231	0.0091	0.0036	0.0014	0.0006	0.0002	0.0001	0.0000	0.0000	0.0000	0.0000	0.0011
1983	0.0001	0.0082	0.0600	0.0255	0.0100	0.0040	0.0016	0.0006	0.0002	0.0001	0.0000	0.0000	0.0000	0.0000	0.0012
1984	0.0001	0.0085	0.0616	0.0262	0.0103	0.0041	0.0016	0.0006	0.0003	0.0001	0.0000	0.0000	0.0000	0.0000	0.0013
1985	0.0000	0.0010	0.0024	0.0021	0.0018	0.0016	0.0014	0.0012	0.0010	0.0009	0.0008	0.0007	0.0006	0.0005	0.0004
1986	0.0001	0.0018	0.0043	0.0038	0.0033	0.0029	0.0025	0.0021	0.0019	0.0016	0.0014	0.0012	0.0010	0.0009	0.0008
1987	0.0000	0.0007	0.0017	0.0016	0.0013	0.0012	0.0010	0.0009	0.0007	0.0006	0.0006	0.0005	0.0004	0.0004	0.0003
1988	0.0001	0.0018	0.0044	0.0039	0.0034	0.0029	0.0025	0.0022	0.0019	0.0016	0.0014	0.0012	0.0011	0.0009	0.0008
1989	0.0000	0.0011	0.0027	0.0024	0.0020	0.0018	0.0015	0.0013	0.0011	0.0010	0.0008	0.0007	0.0006	0.0005	0.0005
1990	0.0002	0.0011	0.0055	0.0224	0.0415	0.0364	0.0260	0.0180	0.0124	0.0085	0.0059	0.0040	0.0028	0.0019	0.0013
1991	0.0002	0.0012	0.0060	0.0243	0.0450	0.0395	0.0282	0.0195	0.0134	0.0093	0.0064	0.0044	0.0030	0.0021	0.0014
1992	0.0002	0.0013	0.0066	0.0270	0.0500	0.0438	0.0313	0.0216	0.0149	0.0103	0.0071	0.0049	0.0034	0.0023	0.0016
1993	0.0002	0.0011	0.0056	0.0230	0.0425	0.0373	0.0266	0.0184	0.0127	0.0087	0.0060	0.0042	0.0029	0.0020	0.0014
1994	0.0003	0.0014	0.0073	0.0300	0.0555	0.0487	0.0347	0.0240	0.0166	0.0114	0.0079	0.0054	0.0037	0.0026	0.0018
1995	0.0004	0.0021	0.0107	0.0437	0.0809	0.0710	0.0506	0.0350	0.0242	0.0166	0.0115	0.0079	0.0054	0.0037	0.0026
1996	0.0007	0.0037	0.0170	0.0430	0.0557	0.0560	0.0533	0.0504	0.0475	0.0448	0.0423	0.0399	0.0376	0.0355	0.0335
1997	0.0007	0.0040	0.0185	0.0466	0.0604	0.0606	0.0578	0.0546	0.0515	0.0486	0.0458	0.0432	0.0408	0.0384	0.0363
1998	0.0006	0.0035	0.0160	0.0404	0.0523	0.0525	0.0500	0.0473	0.0446	0.0421	0.0397	0.0374	0.0353	0.0333	0.0314
1999	0.0006	0.0036	0.0164	0.0414	0.0536	0.0539	0.0513	0.0485	0.0457	0.0432	0.0407	0.0384	0.0362	0.0341	0.0322
2000	0.0007	0.0038	0.0175	0.0442	0.0572	0.0575	0.0548	0.0517	0.0488	0.0460	0.0434	0.0410	0.0386	0.0364	0.0344
2001	0.0006	0.0030	0.0139	0.0352	0.0455	0.0457	0.0436	0.0412	0.0388	0.0366	0.0345	0.0326	0.0307	0.0290	0.0273
2002	0.0006	0.0033	0.0153	0.0385	0.0499	0.0501	0.0477	0.0451	0.0425	0.0401	0.0378	0.0357	0.0337	0.0317	0.0299
2003	0.0008	0.0043	0.0199	0.0502	0.0651	0.0653	0.0623	0.0588	0.0555	0.0523	0.0494	0.0466	0.0439	0.0414	0.0391
2004	0.0008	0.0042	0.0193	0.0488	0.0632	0.0635	0.0605	0.0572	0.0539	0.0509	0.0480	0.0453	0.0427	0.0403	0.0380
2005	0.0007	0.0037	0.0170	0.0429	0.0556	0.0558	0.0532	0.0502	0.0474	0.0447	0.0422	0.0398	0.0375	0.0354	0.0334
2006	0.0009	0.0050	0.0231	0.0584	0.0757	0.0760	0.0724	0.0684	0.0645	0.0609	0.0574	0.0541	0.0511	0.0482	0.0454
2007	0.0007	0.0038	0.0175	0.0441	0.0571	0.0573	0.0546	0.0516	0.0487	0.0459	0.0433	0.0408	0.0385	0.0363	0.0343
2008	0.0006	0.0033	0.0153	0.0385	0.0499	0.0501	0.0477	0.0451	0.0425	0.0401	0.0378	0.0357	0.0337	0.0317	0.0299
2009	0.0008	0.0045	0.0205	0.0518	0.0671	0.0674	0.0642	0.0607	0.0572	0.0540	0.0509	0.0480	0.0453	0.0427	0.0403
2010	0.0009	0.0047	0.0217	0.0548	0.0710	0.0713	0.0679	0.0642	0.0605	0.0571	0.0539	0.0508	0.0479	0.0452	0.0426
2011	0.0008	0.0046	0.0213	0.0538	0.0696	0.0699	0.0666	0.0629	0.0594	0.0560	0.0528	0.0498	0.0470	0.0443	0.0418
2012	0.0010	0.0054	0.0248	0.0625	0.0809	0.0813	0.0775	0.0732	0.0690	0.0651	0.0614	0.0579	0.0546	0.0515	0.0486
2013	0.0011	0.0060	0.0274	0.0692	0.0896	0.0899	0.0857	0.0810	0.0764	0.0720	0.0679	0.0641	0.0604	0.0570	0.0538
2014	0.0012	0.0069	0.0316	0.0798	0.1034	0.1038	0.0989	0.0934	0.0882	0.0832	0.0784	0.0740	0.0698	0.0658	0.0621
2015	0.0010	0.0057	0.0262	0.0662	0.0857	0.0860	0.0820	0.0775	0.0731	0.0689	0.0650	0.0613	0.0578	0.0546	0.0515
2016	0.0014	0.0077	0.0355	0.0896	0.1161	0.1165	0.1110	0.1049	0.0990	0.0934	0.0880	0.0830	0.0783	0.0739	0.0697
2017	0.0010	0.0054	0.0249	0.0630	0.0815	0.0818	0.0780	0.0737	0.0695	0.0656	0.0619	0.0583	0.0550	0.0519	0.0489
2018	0.0008	0.0045	0.0207	0.0523	0.0678	0.0680	0.0648	0.0613	0.0578	0.0545	0.0514	0.0485	0.0457	0.0431	0.0407
2019	0.0006	0.0036	0.0165	0.0416	0.0538	0.0540	0.0515	0.0486	0.0459	0.0433	0.0408	0.0385	0.0363	0.0343	0.0323
2020	0.0009	0.0034	0.0116	0.0344	0.0625	0.0612	0.0447	0.0304	0.0203	0.0136	0.0091	0.0061	0.0040	0.0027	0.0018
2021	0.0008	0.0028	0.0098	0.0289	0.0525	0.0514	0.0376	0.0255	0.0171	0.0114	0.0076	0.0051	0.0034	0.0023	0.0015

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Table 6. Ocean Fishing Mortality-At-Age, 1982-2021.

Year	Age														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15+
1982	0.0001	0.0059	0.0392	0.0901	0.1300	0.1527	0.1640	0.1692	0.1715	0.1726	0.1730	0.1732	0.1733	0.1734	0.1734
1983	0.0001	0.0048	0.0318	0.0732	0.1055	0.1240	0.1331	0.1374	0.1393	0.1401	0.1405	0.1407	0.1407	0.1408	0.1408
1984	0.0000	0.0020	0.0134	0.0307	0.0443	0.0520	0.0559	0.0577	0.0585	0.0588	0.0590	0.0590	0.0591	0.0591	0.0591
1985	0.0006	0.0051	0.0199	0.0463	0.0785	0.1090	0.1338	0.1521	0.1647	0.1731	0.1785	0.1820	0.1842	0.1856	0.1864
1986	0.0002	0.0014	0.0053	0.0123	0.0209	0.0290	0.0356	0.0405	0.0438	0.0461	0.0475	0.0484	0.0490	0.0494	0.0496
1987	0.0001	0.0008	0.0031	0.0073	0.0124	0.0172	0.0211	0.0240	0.0260	0.0273	0.0282	0.0287	0.0291	0.0293	0.0294
1988	0.0001	0.0010	0.0037	0.0086	0.0146	0.0203	0.0249	0.0283	0.0307	0.0322	0.0332	0.0339	0.0343	0.0346	0.0347
1989	0.0001	0.0013	0.0049	0.0113	0.0192	0.0267	0.0328	0.0372	0.0403	0.0424	0.0437	0.0446	0.0451	0.0455	0.0457
1990	0.0002	0.0010	0.0034	0.0082	0.0152	0.0236	0.0322	0.0402	0.0470	0.0525	0.0567	0.0600	0.0624	0.0641	0.0654
1991	0.0003	0.0014	0.0048	0.0116	0.0216	0.0335	0.0457	0.0570	0.0666	0.0744	0.0805	0.0851	0.0885	0.0910	0.0928
1992	0.0003	0.0017	0.0058	0.0140	0.0260	0.0404	0.0551	0.0687	0.0803	0.0897	0.0970	0.1025	0.1066	0.1096	0.1118
1993	0.0002	0.0013	0.0046	0.0110	0.0205	0.0318	0.0434	0.0541	0.0632	0.0706	0.0764	0.0807	0.0839	0.0863	0.0880
1994	0.0003	0.0018	0.0060	0.0144	0.0268	0.0416	0.0568	0.0707	0.0827	0.0924	0.0999	0.1056	0.1098	0.1129	0.1151
1995	0.0006	0.0032	0.0109	0.0262	0.0488	0.0756	0.1032	0.1287	0.1504	0.1680	0.1817	0.1920	0.1997	0.2053	0.2094
1996	0.0006	0.0037	0.0126	0.0302	0.0562	0.0871	0.1189	0.1483	0.1733	0.1935	0.2093	0.2212	0.2301	0.2366	0.2413
1997	0.0005	0.0042	0.0164	0.0390	0.0677	0.0963	0.1205	0.1390	0.1522	0.1613	0.1674	0.1714	0.1740	0.1757	0.1767
1998	0.0005	0.0046	0.0178	0.0422	0.0733	0.1042	0.1304	0.1505	0.1648	0.1747	0.1812	0.1856	0.1884	0.1902	0.1913
1999	0.0005	0.0042	0.0162	0.0386	0.0670	0.0953	0.1192	0.1375	0.1507	0.1597	0.1657	0.1696	0.1722	0.1739	0.1749
2000	0.0005	0.0041	0.0159	0.0377	0.0655	0.0930	0.1164	0.1343	0.1471	0.1559	0.1618	0.1656	0.1681	0.1698	0.1708
2001	0.0005	0.0042	0.0164	0.0390	0.0677	0.0962	0.1203	0.1388	0.1521	0.1611	0.1672	0.1712	0.1738	0.1755	0.1765
2002	0.0005	0.0045	0.0176	0.0418	0.0725	0.1031	0.1290	0.1489	0.1630	0.1728	0.1793	0.1836	0.1864	0.1882	0.1893
2003	0.0006	0.0047	0.0181	0.0430	0.0747	0.1062	0.1329	0.1533	0.1679	0.1779	0.1847	0.1891	0.1919	0.1938	0.1950
2004	0.0006	0.0053	0.0207	0.0492	0.0855	0.1216	0.1521	0.1755	0.1922	0.2037	0.2114	0.2164	0.2197	0.2218	0.2232
2005	0.0006	0.0054	0.0208	0.0495	0.0859	0.1221	0.1528	0.1762	0.1930	0.2046	0.2123	0.2173	0.2206	0.2227	0.2241
2006	0.0007	0.0062	0.0239	0.0569	0.0988	0.1405	0.1758	0.2028	0.2221	0.2354	0.2442	0.2501	0.2539	0.2563	0.2579
2007	0.0005	0.0045	0.0177	0.0420	0.0730	0.1037	0.1298	0.1497	0.1640	0.1738	0.1804	0.1847	0.1875	0.1893	0.1904
2008	0.0006	0.0050	0.0194	0.0460	0.0800	0.1137	0.1422	0.1641	0.1797	0.1904	0.1976	0.2023	0.2054	0.2074	0.2086
2009	0.0005	0.0045	0.0177	0.0420	0.0729	0.1036	0.1297	0.1496	0.1639	0.1737	0.1802	0.1845	0.1873	0.1891	0.1903
2010	0.0007	0.0055	0.0213	0.0506	0.0879	0.1250	0.1564	0.1805	0.1977	0.2095	0.2174	0.2226	0.2259	0.2281	0.2295
2011	0.0007	0.0057	0.0221	0.0524	0.0911	0.1294	0.1620	0.1868	0.2046	0.2169	0.2251	0.2304	0.2339	0.2362	0.2376
2012	0.0007	0.0055	0.0214	0.0508	0.0882	0.1253	0.1568	0.1809	0.1982	0.2100	0.2179	0.2231	0.2265	0.2287	0.2301
2013	0.0010	0.0080	0.0311	0.0740	0.1285	0.1827	0.2286	0.2637	0.2888	0.3061	0.3176	0.3252	0.3301	0.3333	0.3353
2014	0.0007	0.0058	0.0225	0.0535	0.0929	0.1321	0.1653	0.1907	0.2089	0.2214	0.2297	0.2352	0.2387	0.2410	0.2425
2015	0.0006	0.0051	0.0199	0.0474	0.0823	0.1170	0.1464	0.1689	0.1850	0.1961	0.2035	0.2083	0.2115	0.2135	0.2148
2016	0.0007	0.0057	0.0221	0.0525	0.0911	0.1295	0.1620	0.1869	0.2047	0.2169	0.2251	0.2305	0.2340	0.2362	0.2377
2017	0.0009	0.0072	0.0282	0.0669	0.1162	0.1652	0.2067	0.2385	0.2612	0.2769	0.2873	0.2941	0.2986	0.3015	0.3033
2018	0.0006	0.0052	0.0201	0.0477	0.0829	0.1178	0.1474	0.1700	0.1862	0.1974	0.2048	0.2097	0.2129	0.2149	0.2162
2019	0.0006	0.0046	0.0180	0.0429	0.0745	0.1058	0.1324	0.1528	0.1673	0.1773	0.1840	0.1884	0.1913	0.1931	0.1943
2020	0.0006	0.0073	0.0254	0.0477	0.0657	0.0772	0.0837	0.0873	0.0891	0.0901	0.0905	0.0908	0.0909	0.0910	0.0910
2021	0.0007	0.0080	0.0279	0.0525	0.0722	0.0848	0.0921	0.0959	0.0980	0.0990	0.0995	0.0998	0.0999	0.1000	0.1000

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Table 7. Total Fishing Mortality-At-Age, 1982-2021.

Year	Age														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15+
1982	0.0002	0.0134	0.0934	0.1132	0.1390	0.1563	0.1654	0.1697	0.1718	0.1727	0.1731	0.1733	0.1733	0.1734	0.1745
1983	0.0002	0.0130	0.0918	0.0987	0.1156	0.1280	0.1347	0.1380	0.1395	0.1402	0.1405	0.1407	0.1408	0.1408	0.1420
1984	0.0001	0.0105	0.0750	0.0569	0.0546	0.0561	0.0575	0.0583	0.0587	0.0589	0.0590	0.0591	0.0591	0.0591	0.0604
1985	0.0006	0.0061	0.0222	0.0484	0.0803	0.1106	0.1352	0.1532	0.1657	0.1739	0.1793	0.1826	0.1847	0.1861	0.1869
1986	0.0002	0.0031	0.0096	0.0162	0.0242	0.0319	0.0381	0.0426	0.0457	0.0477	0.0489	0.0496	0.0501	0.0503	0.0504
1987	0.0001	0.0015	0.0049	0.0089	0.0137	0.0184	0.0221	0.0249	0.0267	0.0280	0.0287	0.0292	0.0295	0.0297	0.0297
1988	0.0002	0.0028	0.0081	0.0126	0.0180	0.0232	0.0275	0.0305	0.0326	0.0339	0.0347	0.0351	0.0354	0.0355	0.0355
1989	0.0002	0.0023	0.0075	0.0137	0.0213	0.0285	0.0343	0.0386	0.0415	0.0434	0.0446	0.0453	0.0457	0.0460	0.0461
1990	0.0004	0.0021	0.0089	0.0306	0.0567	0.0600	0.0582	0.0582	0.0594	0.0610	0.0626	0.0640	0.0652	0.0661	0.0667
1991	0.0005	0.0026	0.0108	0.0360	0.0666	0.0730	0.0739	0.0765	0.0801	0.0837	0.0868	0.0894	0.0915	0.0930	0.0942
1992	0.0005	0.0030	0.0124	0.0410	0.0760	0.0842	0.0864	0.0903	0.0952	0.0999	0.1040	0.1074	0.1099	0.1119	0.1134
1993	0.0004	0.0024	0.0102	0.0340	0.0630	0.0691	0.0700	0.0725	0.0759	0.0794	0.0824	0.0849	0.0868	0.0883	0.0894
1994	0.0006	0.0032	0.0133	0.0444	0.0823	0.0902	0.0915	0.0948	0.0992	0.1038	0.1077	0.1110	0.1135	0.1155	0.1169
1995	0.0009	0.0052	0.0216	0.0700	0.1297	0.1466	0.1539	0.1637	0.1745	0.1846	0.1931	0.1999	0.2051	0.2091	0.2120
1996	0.0013	0.0074	0.0296	0.0733	0.1119	0.1431	0.1723	0.1986	0.2208	0.2384	0.2516	0.2611	0.2677	0.2721	0.2748
1997	0.0012	0.0082	0.0349	0.0856	0.1281	0.1569	0.1782	0.1935	0.2037	0.2099	0.2132	0.2146	0.2147	0.2141	0.2130
1998	0.0012	0.0081	0.0338	0.0826	0.1256	0.1567	0.1805	0.1977	0.2094	0.2167	0.2209	0.2230	0.2237	0.2235	0.2227
1999	0.0011	0.0078	0.0326	0.0800	0.1207	0.1491	0.1706	0.1860	0.1964	0.2028	0.2064	0.2080	0.2084	0.2080	0.2071
2000	0.0012	0.0079	0.0334	0.0819	0.1227	0.1505	0.1712	0.1860	0.1959	0.2019	0.2052	0.2066	0.2068	0.2062	0.2052
2001	0.0011	0.0073	0.0303	0.0741	0.1132	0.1419	0.1639	0.1800	0.1909	0.1978	0.2018	0.2038	0.2045	0.2044	0.2039
2002	0.0011	0.0078	0.0328	0.0803	0.1224	0.1532	0.1767	0.1939	0.2056	0.2129	0.2171	0.2193	0.2200	0.2199	0.2192
2003	0.0013	0.0090	0.0380	0.0933	0.1398	0.1715	0.1951	0.2121	0.2234	0.2303	0.2340	0.2356	0.2358	0.2352	0.2340
2004	0.0014	0.0095	0.0401	0.0981	0.1488	0.1850	0.2126	0.2326	0.2461	0.2546	0.2593	0.2617	0.2624	0.2620	0.2611
2005	0.0013	0.0091	0.0378	0.0924	0.1415	0.1779	0.2059	0.2265	0.2404	0.2493	0.2544	0.2571	0.2581	0.2581	0.2575
2006	0.0016	0.0112	0.0471	0.1153	0.1745	0.2164	0.2482	0.2712	0.2866	0.2962	0.3016	0.3042	0.3049	0.3045	0.3033
2007	0.0012	0.0084	0.0351	0.0861	0.1301	0.1610	0.1844	0.2013	0.2127	0.2197	0.2237	0.2255	0.2260	0.2256	0.2247
2008	0.0012	0.0083	0.0346	0.0845	0.1298	0.1637	0.1899	0.2091	0.2222	0.2305	0.2354	0.2380	0.2390	0.2391	0.2386
2009	0.0013	0.0090	0.0382	0.0938	0.1400	0.1710	0.1939	0.2103	0.2211	0.2276	0.2311	0.2325	0.2326	0.2318	0.2305
2010	0.0015	0.0102	0.0430	0.1055	0.1589	0.1963	0.2243	0.2446	0.2582	0.2666	0.2712	0.2734	0.2738	0.2733	0.2721
2011	0.0015	0.0103	0.0434	0.1062	0.1607	0.1993	0.2286	0.2498	0.2640	0.2729	0.2779	0.2802	0.2809	0.2805	0.2794
2012	0.0016	0.0109	0.0461	0.1133	0.1691	0.2066	0.2343	0.2541	0.2672	0.2751	0.2794	0.2811	0.2812	0.2802	0.2787
2013	0.0020	0.0140	0.0585	0.1431	0.2180	0.2726	0.3142	0.3446	0.3652	0.3781	0.3855	0.3893	0.3905	0.3903	0.3891
2014	0.0019	0.0127	0.0541	0.1333	0.1963	0.2359	0.2642	0.2841	0.2970	0.3045	0.3081	0.3091	0.3085	0.3068	0.3046
2015	0.0016	0.0108	0.0462	0.1136	0.1680	0.2031	0.2284	0.2464	0.2581	0.2650	0.2685	0.2696	0.2693	0.2681	0.2663
2016	0.0021	0.0134	0.0576	0.1421	0.2071	0.2460	0.2730	0.2918	0.3037	0.3103	0.3132	0.3135	0.3123	0.3101	0.3074
2017	0.0018	0.0127	0.0531	0.1299	0.1978	0.2471	0.2848	0.3122	0.3308	0.3424	0.3491	0.3525	0.3536	0.3534	0.3523
2018	0.0014	0.0097	0.0408	0.1001	0.1506	0.1858	0.2122	0.2313	0.2440	0.2519	0.2562	0.2582	0.2586	0.2581	0.2569
2019	0.0012	0.0082	0.0345	0.0844	0.1283	0.1599	0.1839	0.2014	0.2132	0.2206	0.2248	0.2269	0.2276	0.2273	0.2266
2020	0.0016	0.0107	0.0370	0.0821	0.1282	0.1383	0.1284	0.1176	0.1094	0.1036	0.0996	0.0968	0.0949	0.0937	0.0928
2021	0.0015	0.0108	0.0377	0.0814	0.1247	0.1363	0.1296	0.1215	0.1151	0.1104	0.1072	0.1049	0.1033	0.1023	0.1016

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Table 9. Estimates of female spawning stock biomass, 1982-2021.

Year	Age															Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15+	
1982	0.0	0.0	0.0	145.8	375.5	411.5	874.9	791.2	861.0	2,012.0	1,828.1	2,987.7	1,925.8	1,557.2	4,727.7	18,498.3
1983	0.0	0.0	0.0	105.6	576.1	566.4	623.0	834.9	730.4	855.1	1,664.3	1,304.2	2,466.3	1,476.8	4,410.6	15,613.7
1984	0.0	0.0	0.0	154.1	482.9	958.1	1,316.9	752.9	940.9	704.6	732.3	1,618.5	1,183.5	2,171.0	4,766.9	15,782.6
1985	0.0	0.0	0.0	240.8	600.2	854.5	2,279.5	1,467.7	935.6	899.6	694.9	724.1	1,375.3	1,034.5	5,345.0	16,451.8
1986	0.0	0.0	0.0	582.1	879.4	996.9	1,566.1	2,278.6	1,358.6	697.5	718.0	543.8	538.8	917.0	3,760.8	14,837.5
1987	0.0	0.0	0.0	484.3	2,079.7	1,374.8	2,069.5	1,793.7	2,473.7	1,334.3	692.4	724.0	507.6	494.2	4,218.9	18,246.9
1988	0.0	0.0	0.0	526.5	2,100.6	3,766.1	3,364.1	2,587.0	2,072.7	2,244.4	1,484.9	781.4	699.5	481.5	4,016.0	24,124.8
1989	0.0	0.0	0.0	521.8	2,255.2	3,829.2	9,034.4	4,772.5	3,395.4	2,700.0	2,740.7	1,484.9	758.9	664.3	3,902.6	36,059.9
1990	0.0	0.0	0.0	553.9	1,829.8	3,696.3	7,601.1	10,244.5	4,918.8	3,087.7	2,317.8	2,612.4	1,281.2	606.9	3,266.7	42,017.0
1991	0.0	0.0	0.0	737.1	2,107.3	2,788.6	7,662.7	8,200.3	11,048.6	4,355.3	3,626.5	1,993.0	2,361.2	1,151.3	3,344.7	49,376.5
1992	0.0	0.0	0.0	786.2	2,905.4	3,432.2	6,794.3	8,746.7	9,656.4	11,124.4	5,086.9	4,017.6	2,387.5	2,596.7	5,128.4	62,662.5
1993	0.0	0.0	0.0	988.8	3,141.4	4,391.0	7,384.7	8,308.7	10,187.1	9,266.7	10,681.2	4,854.3	3,390.3	2,107.4	5,688.2	70,389.6
1994	0.0	0.0	0.0	838.9	3,976.9	4,887.8	9,715.3	9,005.2	9,271.8	9,364.5	9,091.6	9,770.2	4,364.5	2,828.5	6,097.5	79,212.5
1995	0.0	0.0	0.0	927.4	3,090.2	6,105.5	11,410.0	11,391.3	10,256.1	9,382.7	7,594.9	7,462.4	8,059.3	3,441.9	6,334.8	85,456.6
1996	0.0	0.0	0.0	1,125.8	3,545.7	5,275.1	14,959.1	13,525.2	12,756.4	9,561.9	7,636.7	6,793.6	6,255.0	6,430.1	7,515.6	95,380.3
1997	0.0	0.0	0.0	2,589.0	3,957.4	4,851.6	9,030.3	12,295.1	11,981.3	11,028.6	7,545.1	5,695.7	5,808.0	4,871.0	10,574.0	90,227.3
1998	0.0	0.0	0.0	1,147.3	7,244.0	4,811.8	9,056.4	9,043.2	12,528.9	8,951.1	7,290.2	5,428.2	4,348.4	4,183.0	9,830.9	83,863.2
1999	0.0	0.0	0.0	1,328.7	3,707.8	8,619.1	8,053.8	8,585.9	9,219.3	10,950.4	7,599.5	5,859.1	4,368.6	3,553.6	11,177.9	83,023.7
2000	0.0	0.0	0.0	1,475.8	4,634.1	5,779.0	18,578.5	9,678.4	9,870.9	7,713.8	9,643.6	6,696.5	5,442.3	3,758.7	11,829.7	95,101.2
2001	0.0	0.0	0.0	955.3	5,718.9	8,225.6	12,844.4	21,382.1	11,063.9	8,524.7	6,503.9	6,470.0	4,991.8	3,814.9	8,925.5	99,420.8
2002	0.0	0.0	0.0	890.5	3,363.1	9,436.4	17,154.9	15,017.4	22,889.7	9,878.7	7,127.4	5,309.8	5,756.9	4,112.0	10,391.9	111,329.0
2003	0.0	0.0	0.0	660.0	3,358.4	5,314.4	18,798.0	18,161.3	15,081.3	20,003.9	8,073.3	5,363.0	4,243.5	4,534.2	9,915.0	113,506.0
2004	0.0	0.0	0.0	1,023.8	2,788.6	5,274.8	10,457.6	19,784.5	18,232.7	12,480.4	16,197.7	6,033.2	4,123.3	3,144.5	9,795.6	109,337.0
2005	0.0	0.0	0.0	1,309.4	4,086.8	4,337.2	10,459.9	11,489.4	20,421.9	15,165.0	10,217.6	13,186.1	4,951.8	3,238.3	9,552.5	108,416.0
2006	0.0	0.0	0.0	631.1	4,602.7	5,990.7	7,741.9	11,088.6	11,761.6	16,943.4	12,429.6	7,804.7	10,370.5	3,808.1	8,932.1	102,105.0
2007	0.0	0.0	0.0	1,530.8	2,347.3	7,218.8	12,452.7	8,188.5	11,489.8	9,395.9	13,985.6	9,623.4	6,402.9	7,956.4	9,237.5	99,829.6
2008	0.0	0.0	0.0	837.0	6,580.6	4,259.0	17,490.6	13,998.0	9,043.9	10,182.8	7,842.1	10,767.7	7,943.4	4,991.0	12,138.7	106,075.0
2009	0.0	0.0	0.0	752.1	3,048.2	11,466.6	8,710.9	18,210.7	14,952.5	7,686.3	7,892.3	5,797.5	8,493.9	5,943.9	11,643.9	104,599.0
2010	0.0	0.0	0.0	437.4	2,734.5	5,473.2	22,864.5	8,614.0	17,024.1	12,298.7	6,279.2	5,731.0	4,605.2	6,428.1	12,258.8	104,749.0
2011	0.0	0.0	0.0	772.2	1,583.2	4,476.3	10,548.3	22,585.5	8,575.3	13,871.4	9,050.7	4,726.5	4,584.4	3,499.6	13,282.7	97,556.0
2012	0.0	0.0	0.0	429.1	2,901.2	2,685.3	9,420.5	11,685.3	23,258.0	7,574.1	11,261.8	7,328.8	3,764.8	3,620.9	12,005.9	95,935.6
2013	0.0	0.0	0.0	482.6	1,545.8	4,549.9	5,138.5	9,333.4	11,353.0	18,707.6	5,851.7	8,625.3	5,777.6	2,796.8	10,588.0	84,750.1
2014	0.0	0.0	0.0	564.2	1,797.8	2,140.3	8,005.4	4,870.1	8,980.2	8,762.6	13,742.2	4,373.2	6,569.9	4,249.3	9,291.3	73,346.4
2015	0.0	0.0	0.0	1,158.5	2,523.1	3,183.3	4,312.2	8,183.3	5,044.0	6,933.9	6,387.7	10,382.0	3,055.2	4,442.4	7,809.4	63,414.9
2016	0.0	0.0	0.0	299.4	4,302.8	4,021.6	6,219.4	4,708.9	8,435.1	4,494.3	5,881.4	5,141.7	8,693.8	2,410.2	9,618.8	64,227.4
2017	0.0	0.0	0.0	412.4	1,345.3	6,539.0	7,283.8	5,502.5	4,111.2	6,811.4	3,324.9	4,255.1	3,936.4	6,249.7	7,334.6	57,106.2
2018	0.0	0.0	0.0	797.7	1,530.5	2,196.1	11,389.4	6,741.0	5,675.1	3,501.8	5,337.6	2,623.8	3,178.1	2,626.2	9,522.9	55,120.3
2019	0.0	0.0	0.0	1,242.3	3,052.0	2,428.7	3,927.0	13,810.6	7,732.0	4,899.2	2,927.5	4,177.4	2,108.0	2,409.5	7,920.0	56,634.1
2020	0.0	0.0	0.0	620.1	4,863.5	4,698.5	5,194.9	4,773.2	14,328.6	6,921.7	4,249.9	2,446.1	3,366.4	1,441.1	7,076.1	59,980.3
2021	0.0	0.0	0.0	747.6	2,368.8	7,218.7	10,002.4	5,738.2	4,475.4	13,863.5	4,495.5	3,637.8	2,252.2	2,830.6	7,174.6	64,805.3

Table 10. Estimate of total female spawning stock biomass with associated standard errors and coefficients of variation.

Year	Total	SE	CV
1982	18,498.3	2,503.5	0.135
1983	15,613.7	2,222.4	0.142
1984	15,782.6	2,227.6	0.141
1985	16,451.8	2,168.2	0.132
1986	14,837.5	1,853.5	0.125
1987	18,246.9	2,045.6	0.112
1988	24,124.8	2,308.8	0.096
1989	36,059.9	2,987.1	0.083
1990	42,017.0	3,143.0	0.075
1991	49,376.5	3,516.2	0.071
1992	62,662.5	4,466.7	0.071
1993	70,389.6	4,811.8	0.068
1994	79,212.5	5,098.9	0.064
1995	85,456.6	5,224.7	0.061
1996	95,380.3	5,924.5	0.062
1997	90,227.3	5,980.4	0.066
1998	83,863.2	5,138.6	0.061
1999	83,023.7	5,080.4	0.061
2000	95,101.2	5,484.7	0.058
2001	99,420.8	5,210.0	0.052
2002	111,329.0	5,770.6	0.052
2003	113,506.0	5,879.3	0.052
2004	109,337.0	5,831.2	0.053
2005	108,416.0	6,006.0	0.055
2006	102,105.0	5,861.8	0.057
2007	99,829.6	5,908.9	0.059
2008	106,075.0	5,872.6	0.055
2009	104,599.0	5,640.0	0.054
2010	104,749.0	5,512.3	0.053
2011	97,556.0	5,396.3	0.055
2012	95,935.6	5,634.8	0.059
2013	84,750.1	5,475.6	0.065
2014	73,346.4	5,526.5	0.075
2015	63,414.9	5,051.1	0.080
2016	64,227.4	5,429.4	0.085
2017	57,106.2	5,230.7	0.092
2018	55,120.3	5,571.5	0.101
2019	56,634.1	5,917.2	0.104
2020	59,980.3	6,369.9	0.106
2021	64,805.3	6,945.1	0.107

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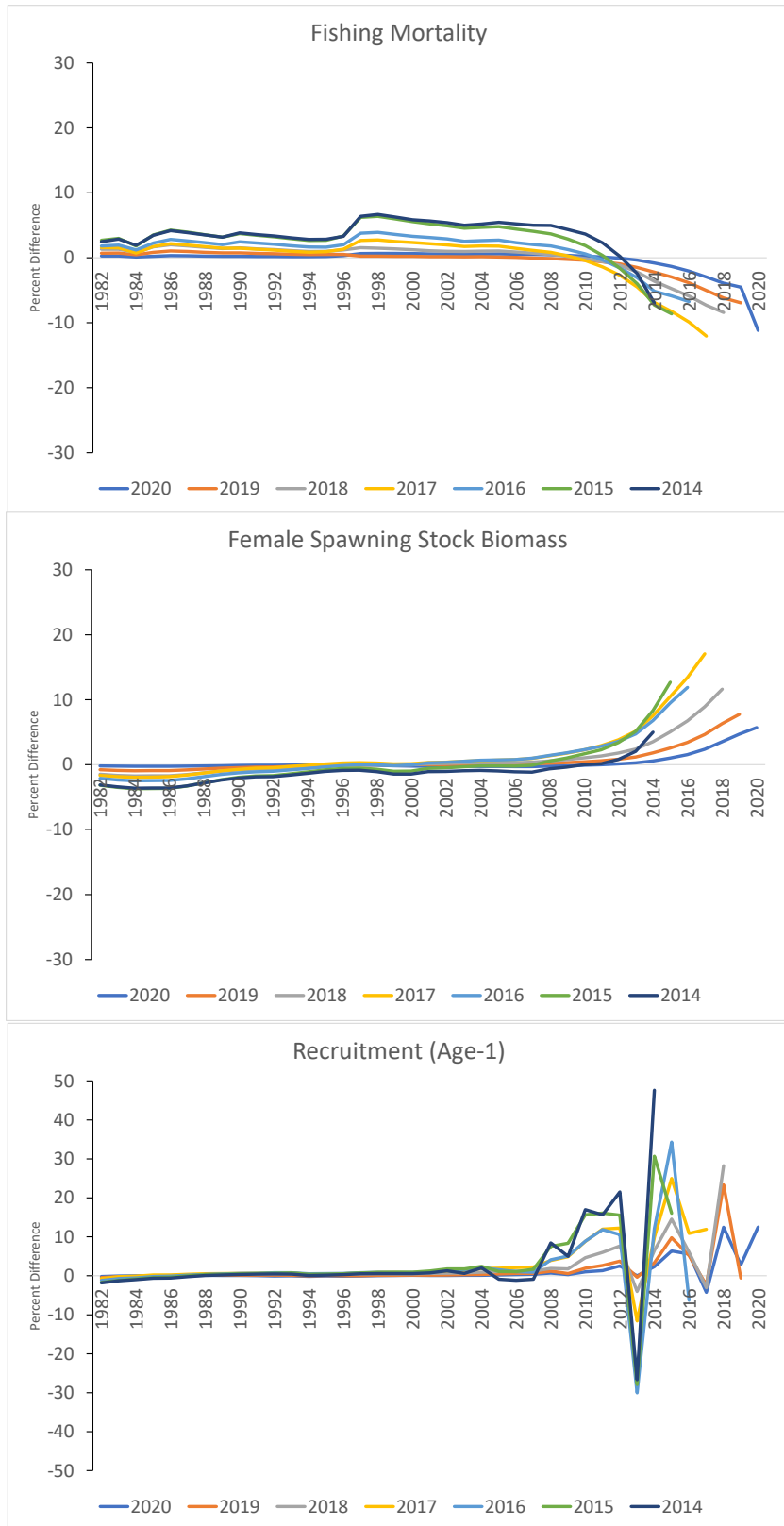


Figure 1. Base model retrospective plots of seven-year peels for fishing mortality, female spawning stock biomass and recruitment.

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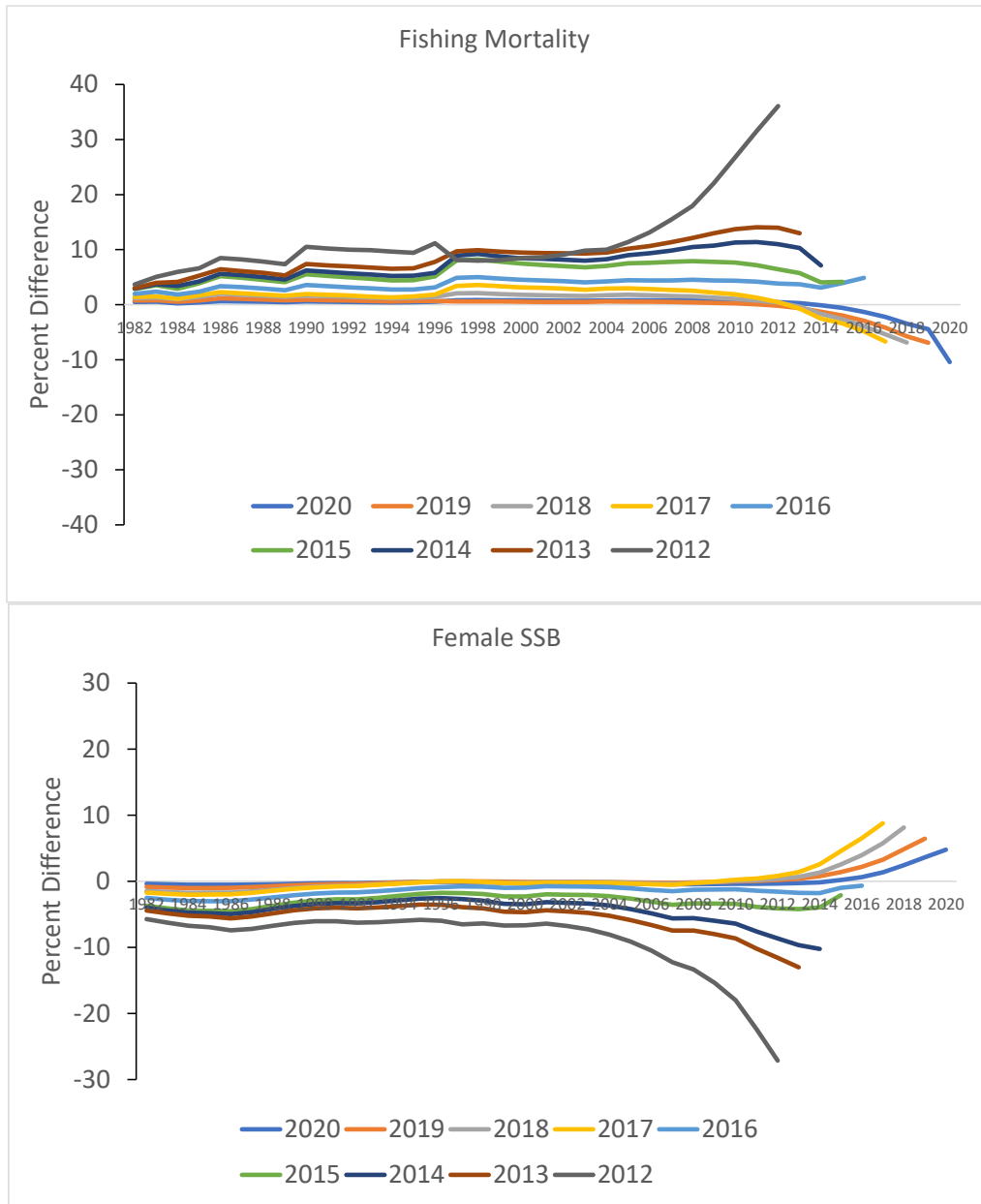
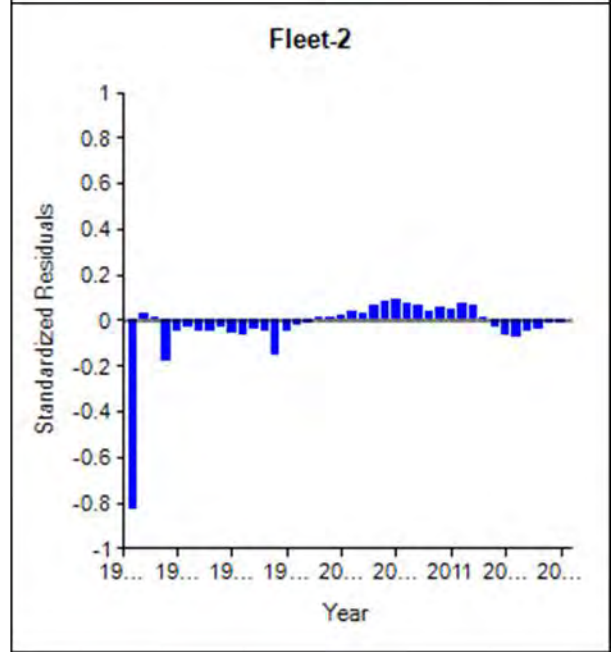
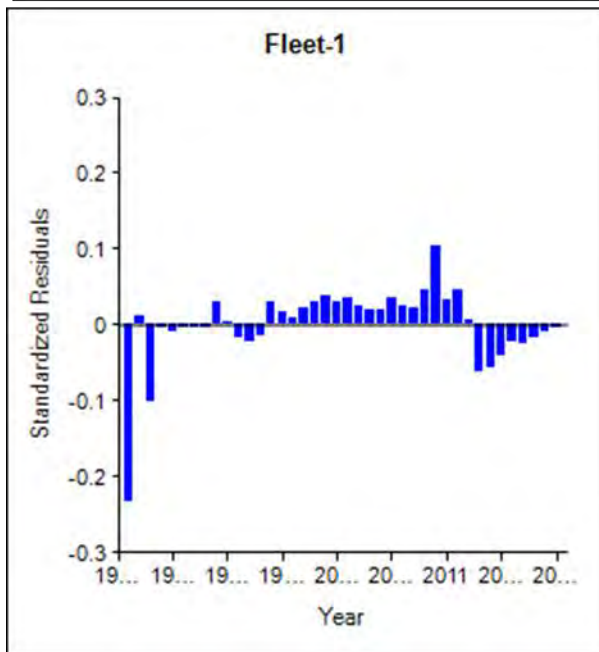
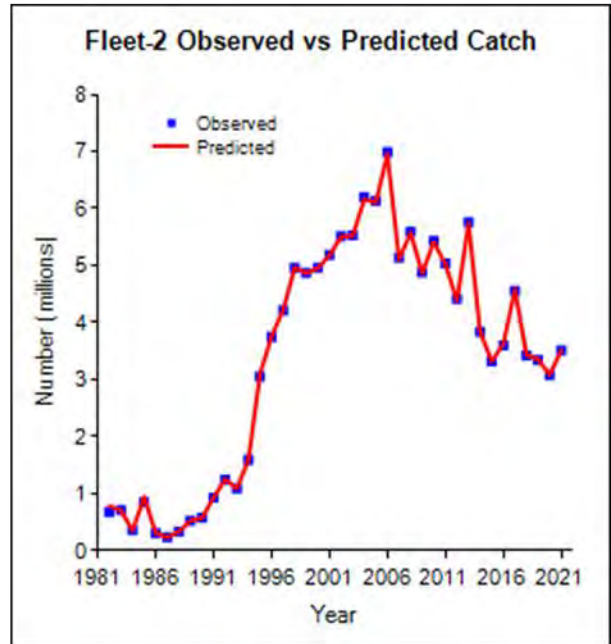
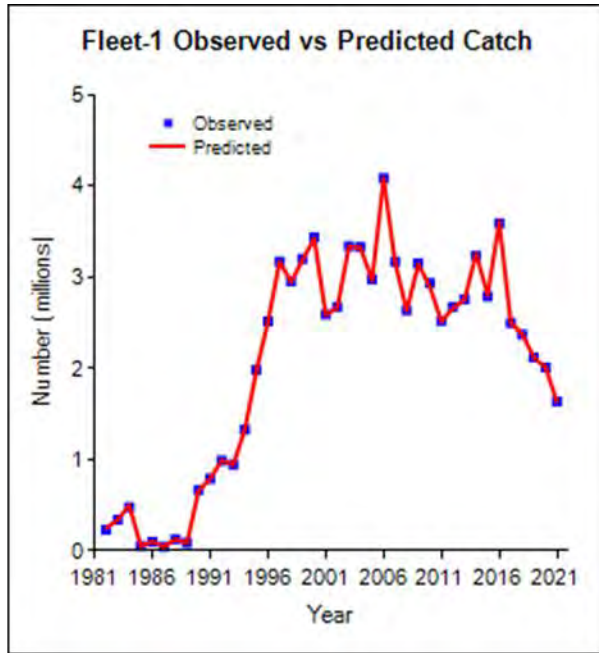


Figure 2. Plots showing changes in the retrospective pattern when the index CV weights from the 2018 benchmark are used in the current assessment.

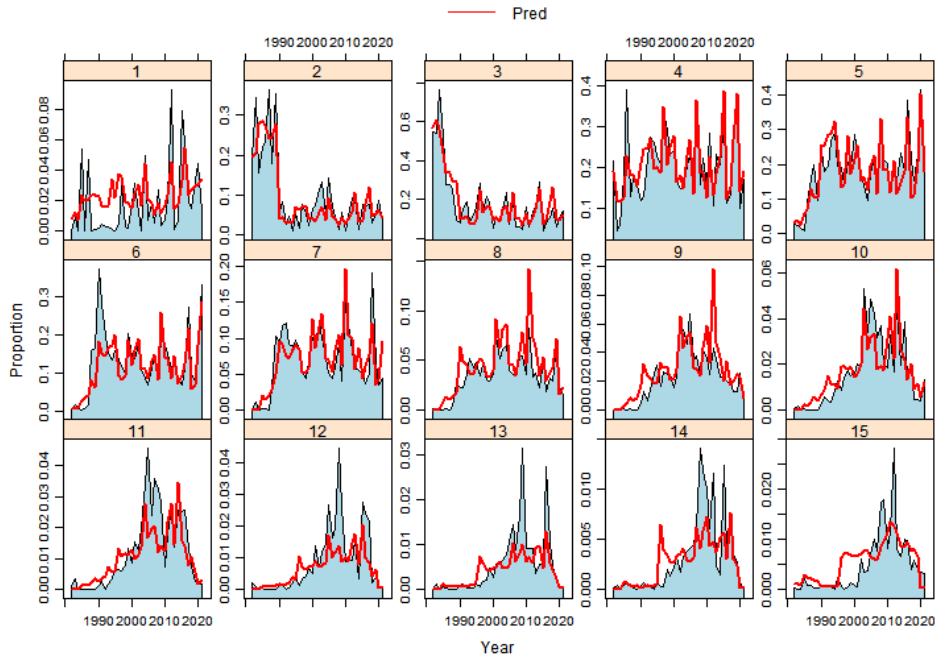
Appendix 2. Diagnostic plots for the base model in which new 2020-2021 selectivity blocks were added for the Bay and Ocean regions.

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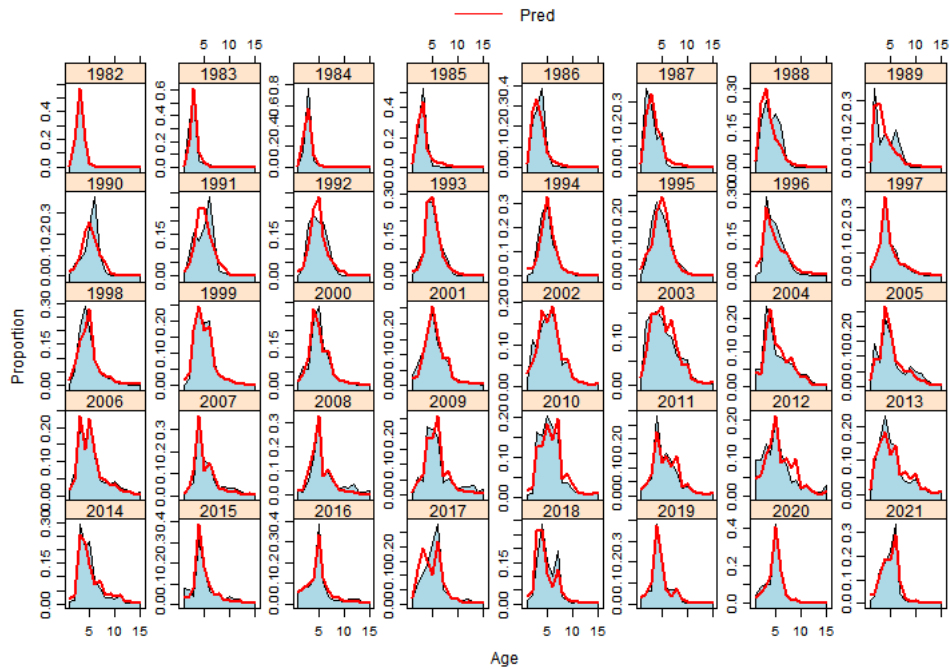


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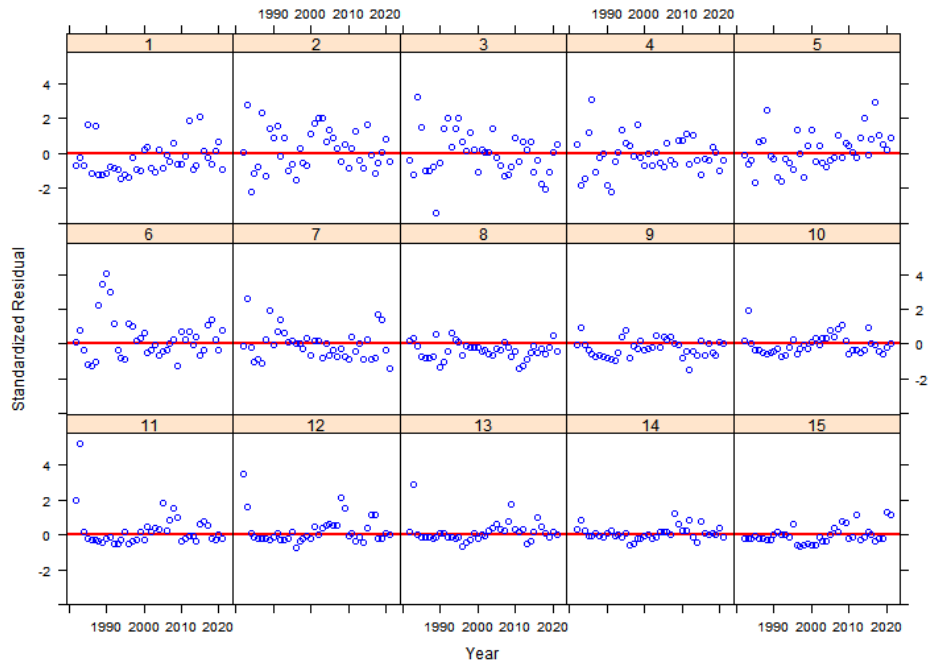
Fleet 1 Catch Age Composition By Age



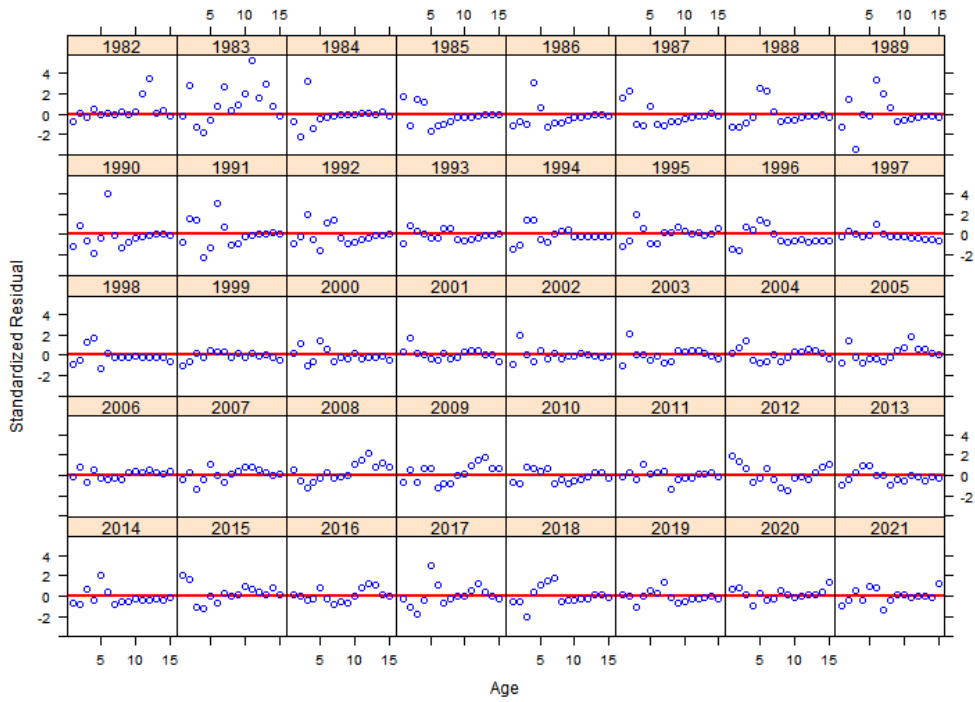
Fleet 1 Catch Age Composition By Year



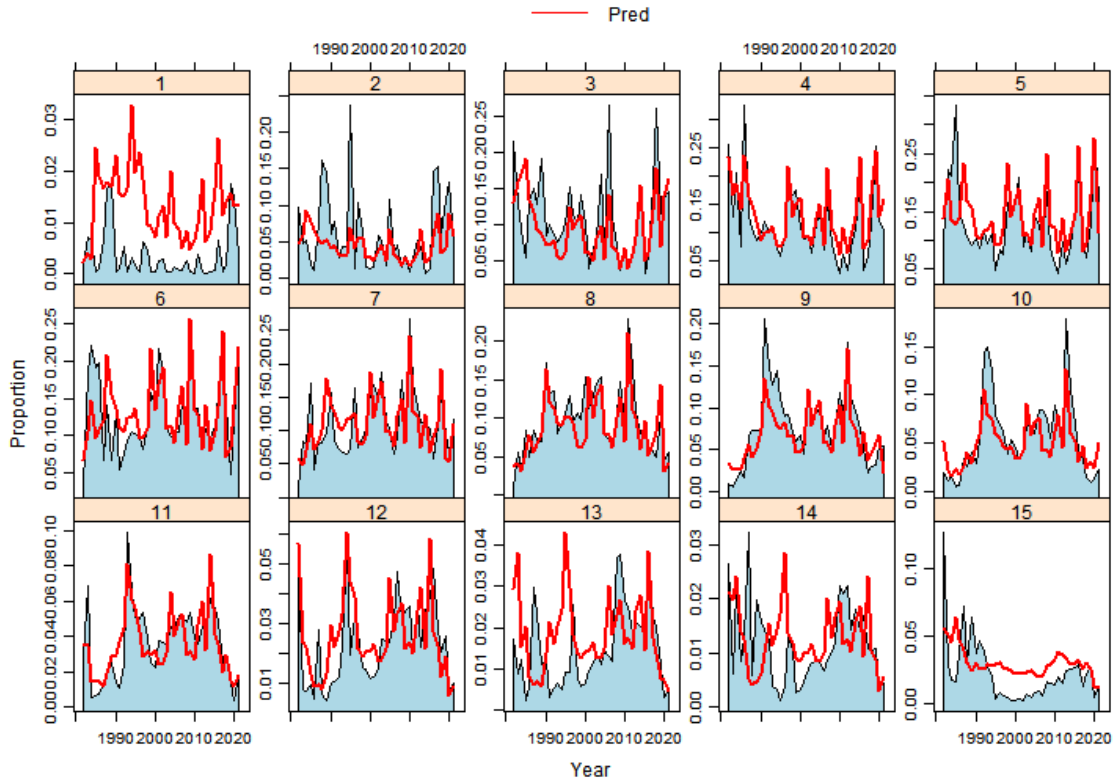
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Fleet 1 Residuals of Age Composition By Age



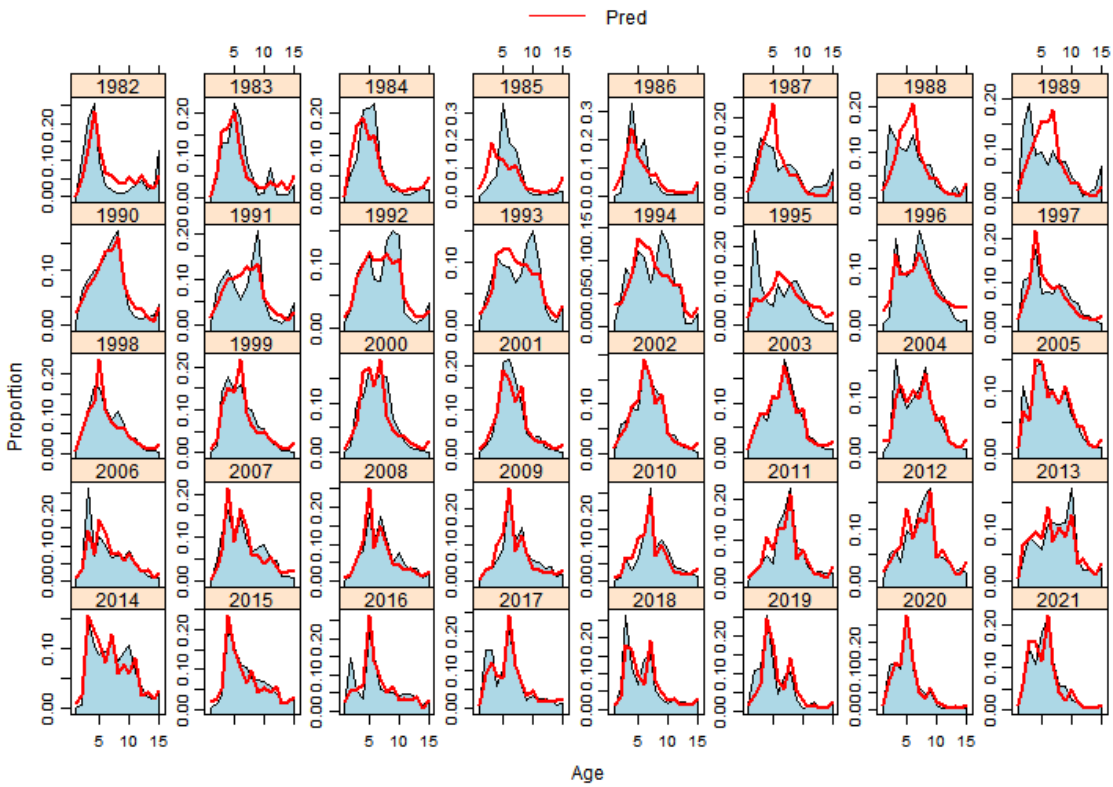
Fleet 1 Residuals of Age Composition By Year



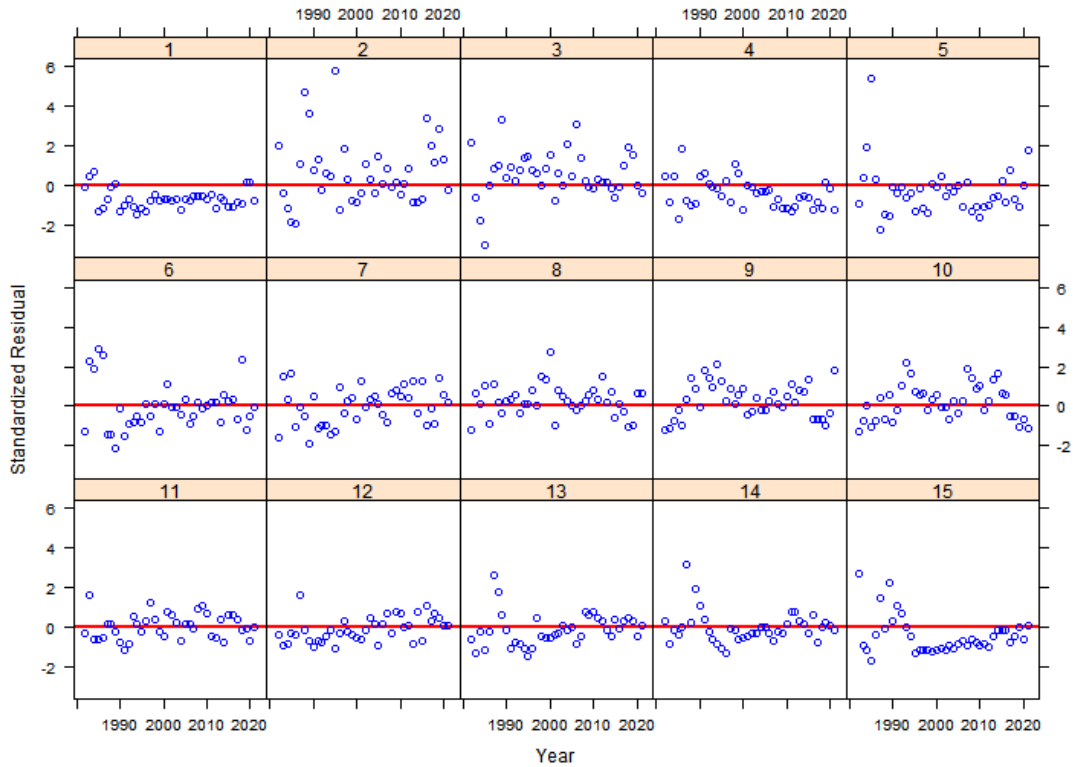
Fleet 2 Catch Age Composition By Age



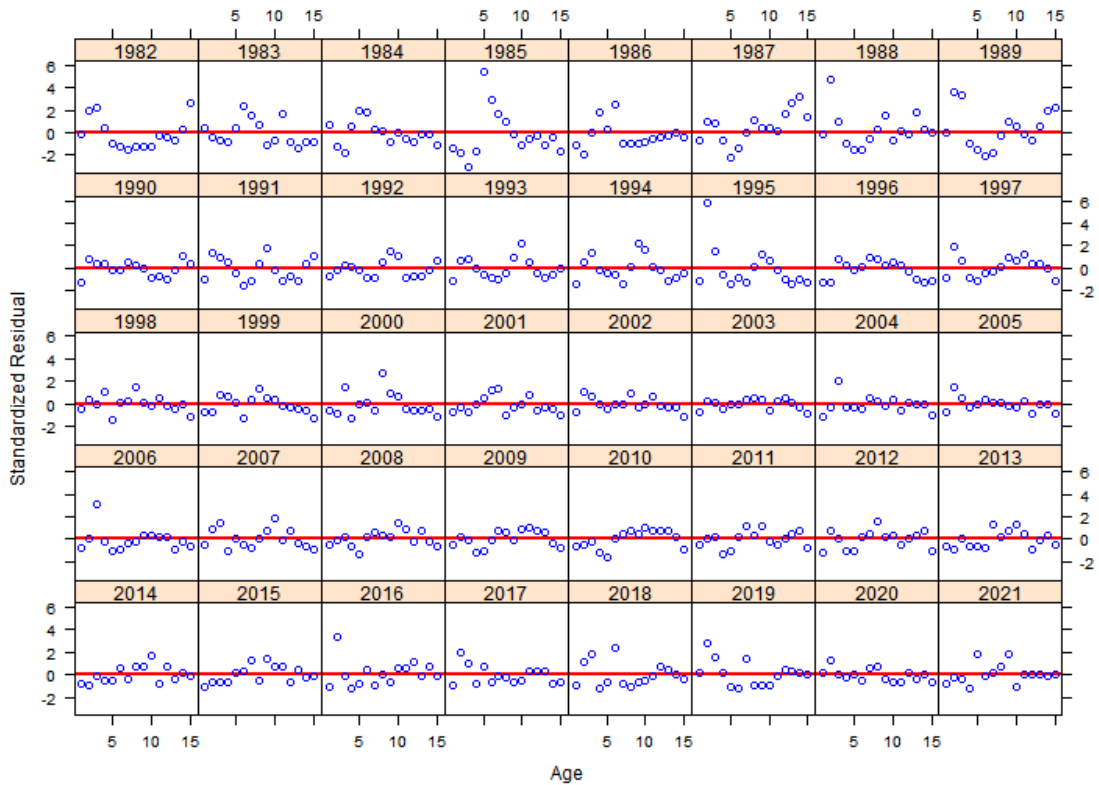
Fleet 2 Catch Age Composition By Year



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Fleet 2 Residuals of Age Composition By Age

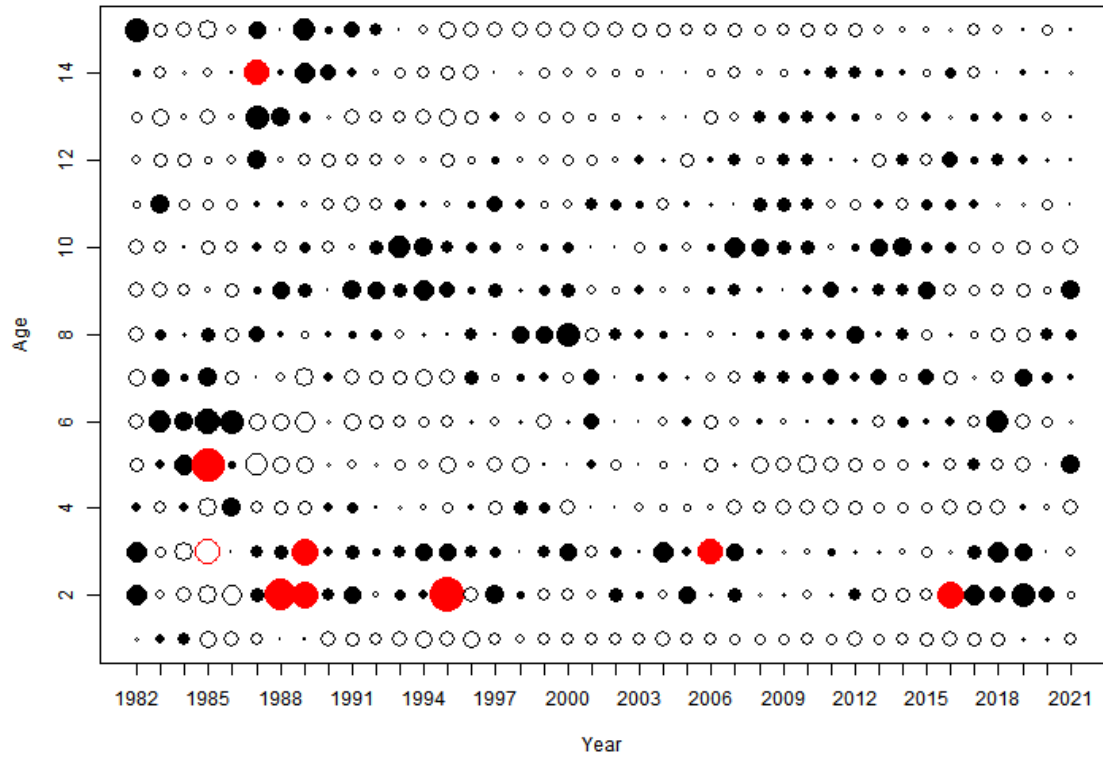


Fleet 2 Residuals of Age Composition By Year

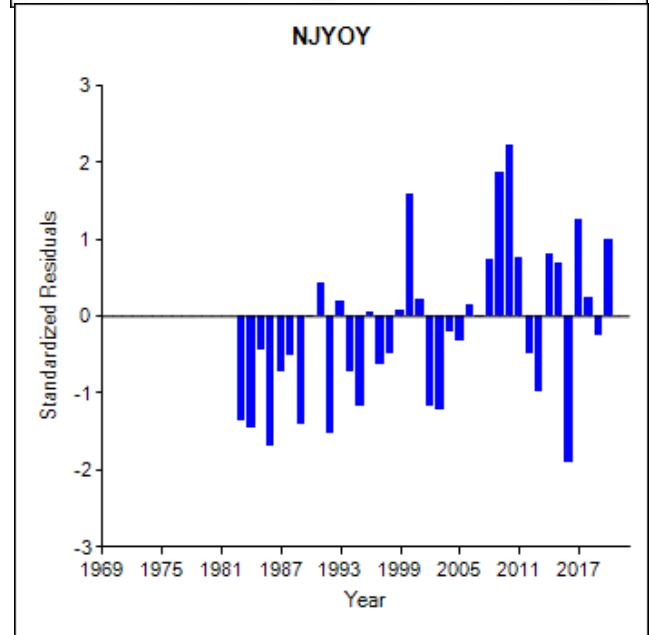
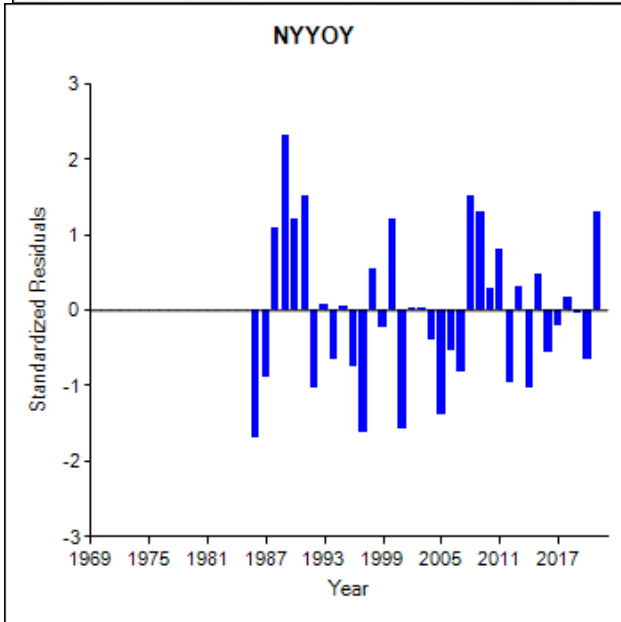
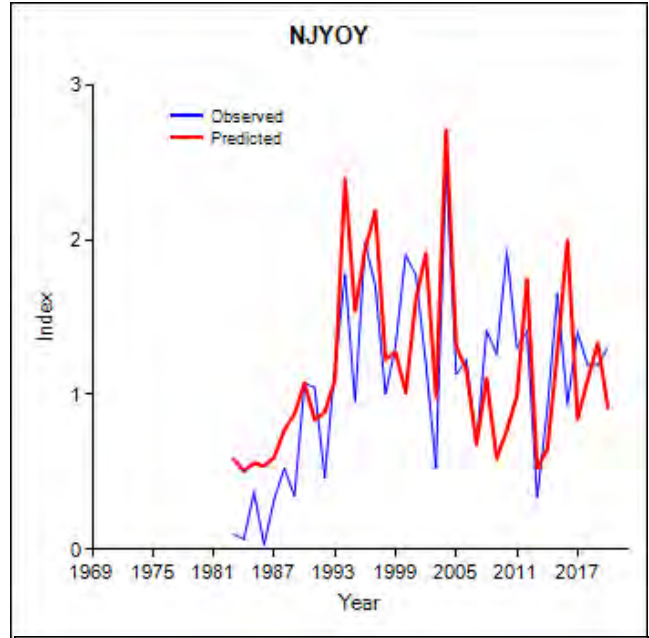
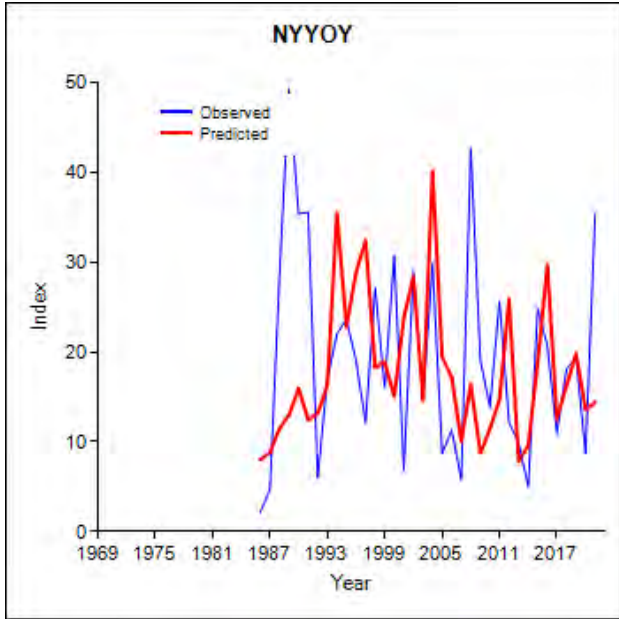


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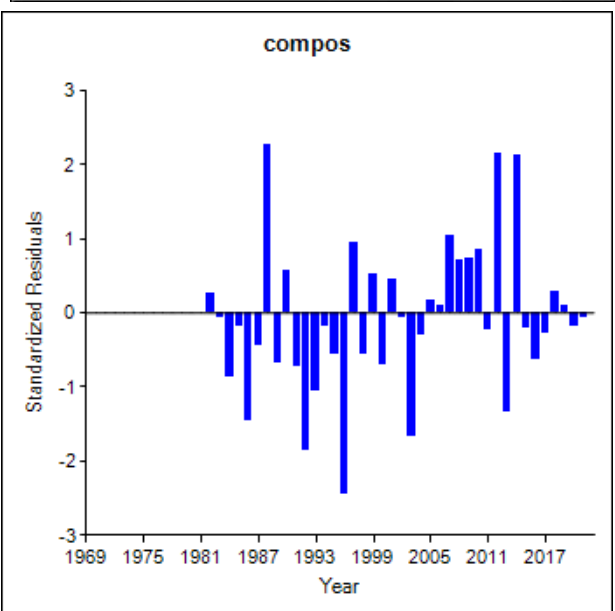
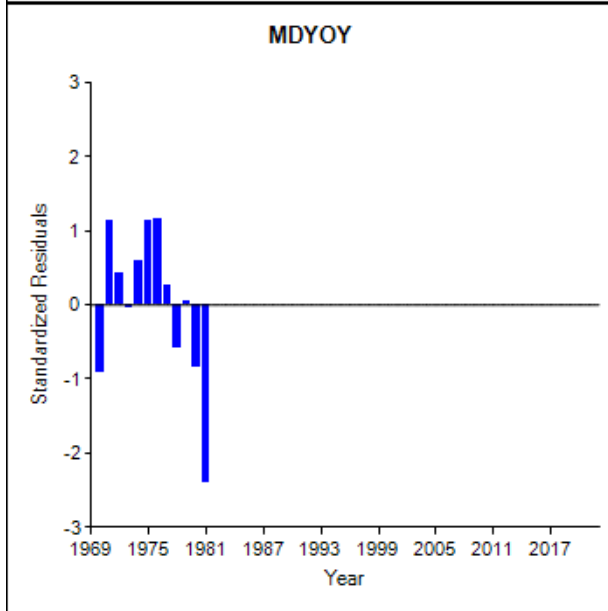
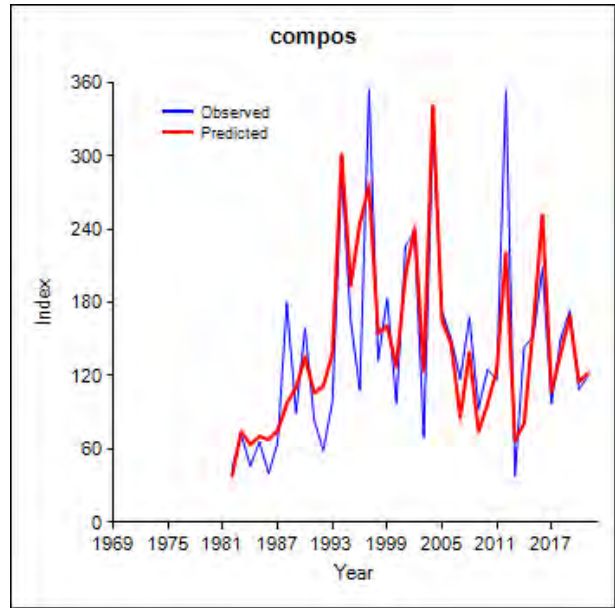
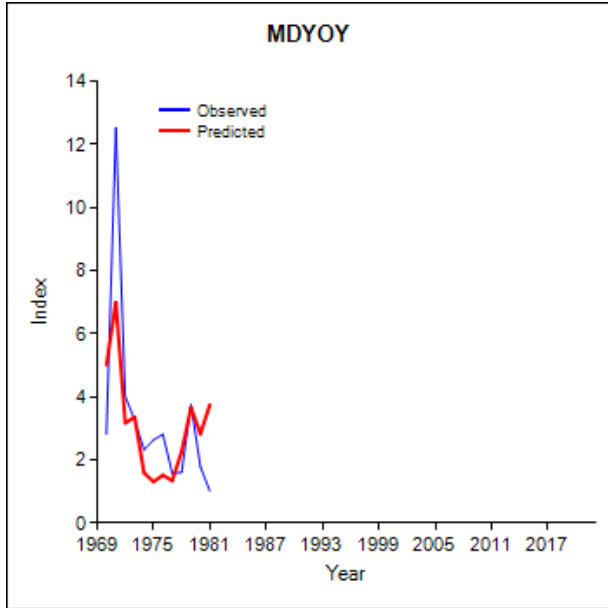
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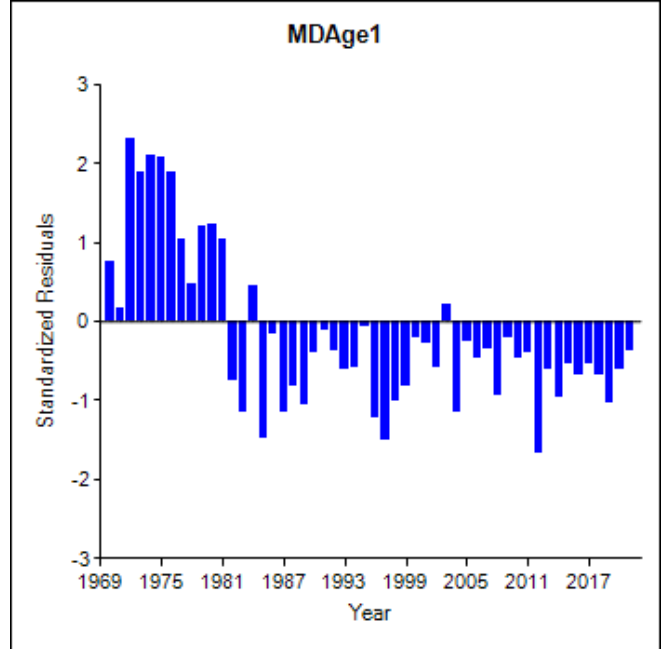
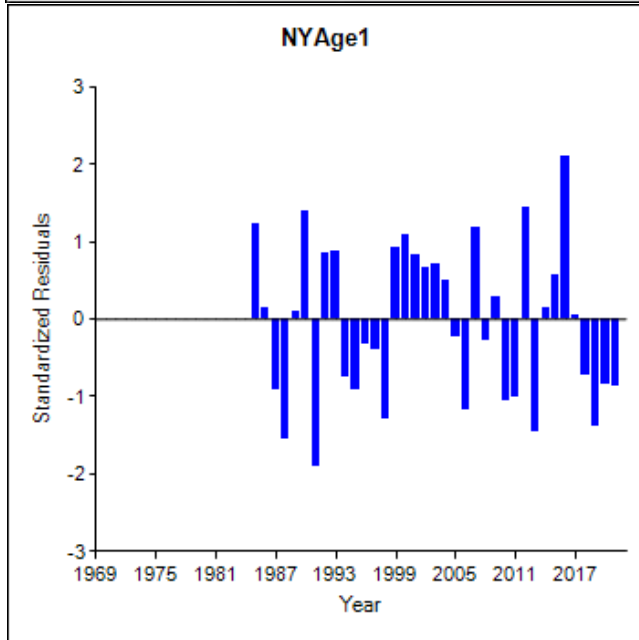
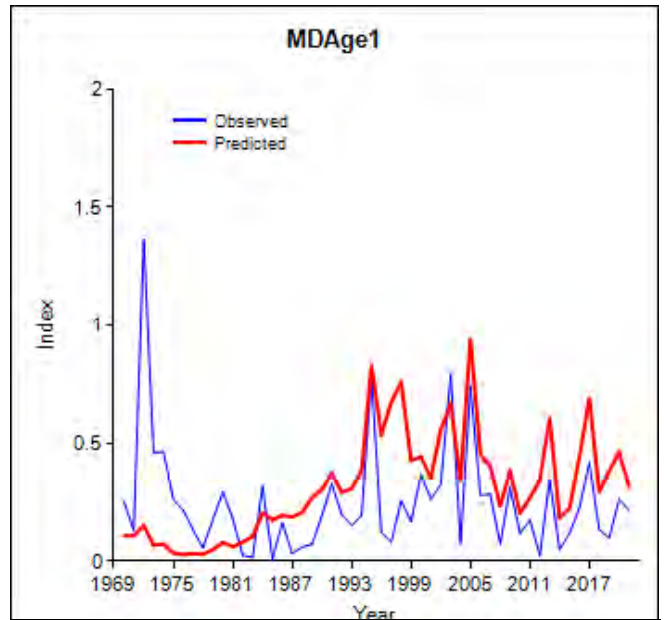
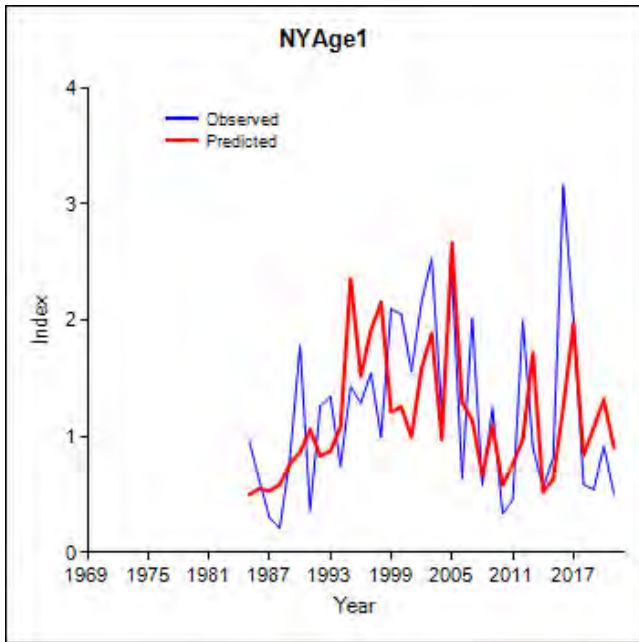
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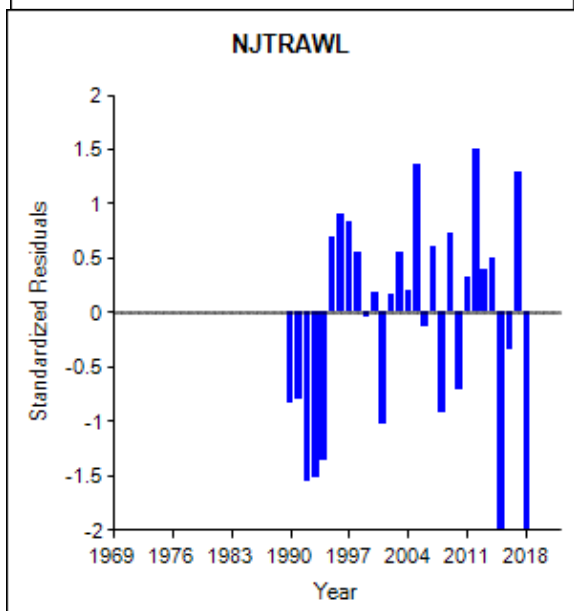
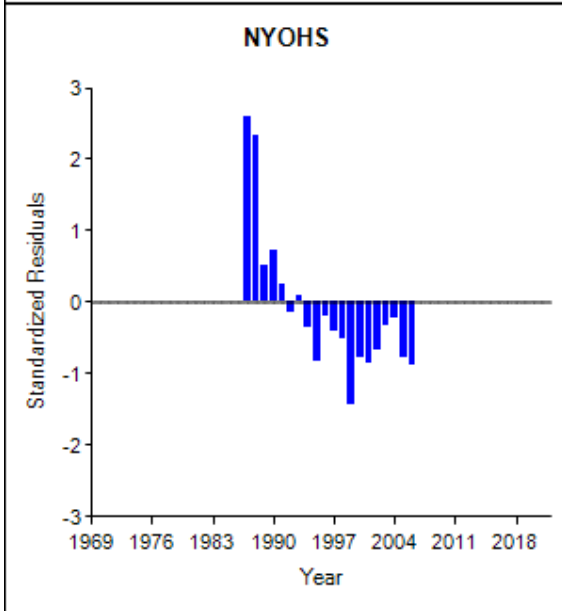
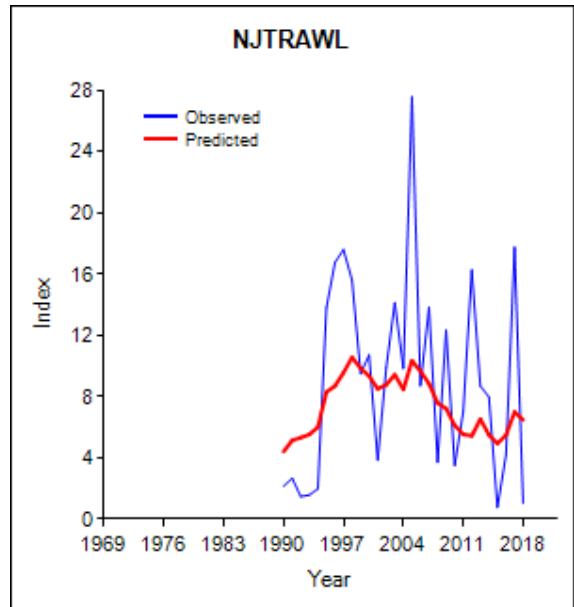
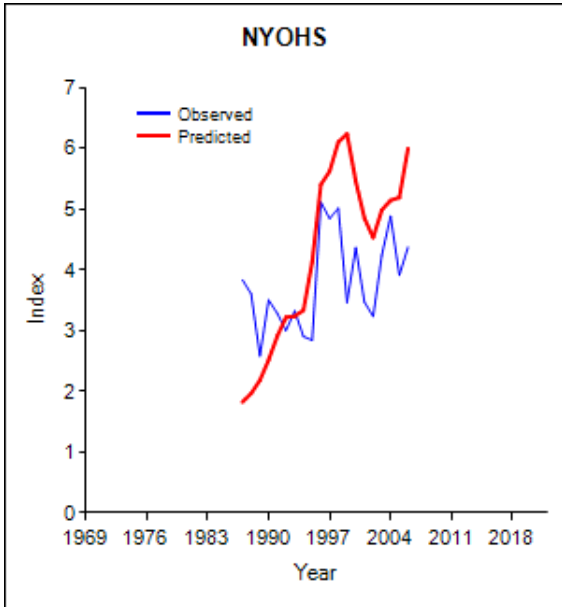
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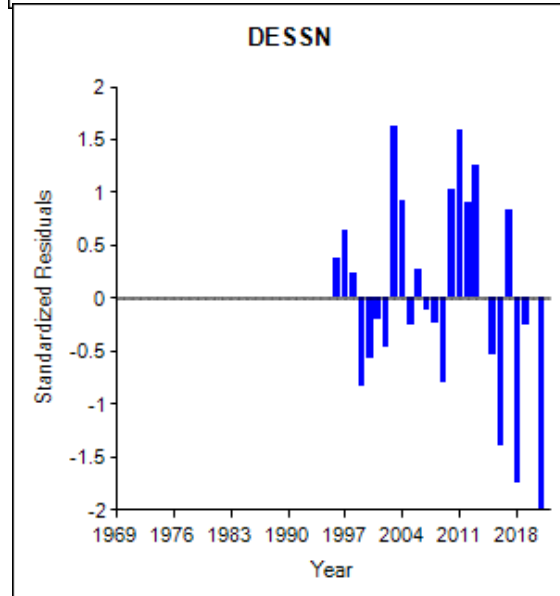
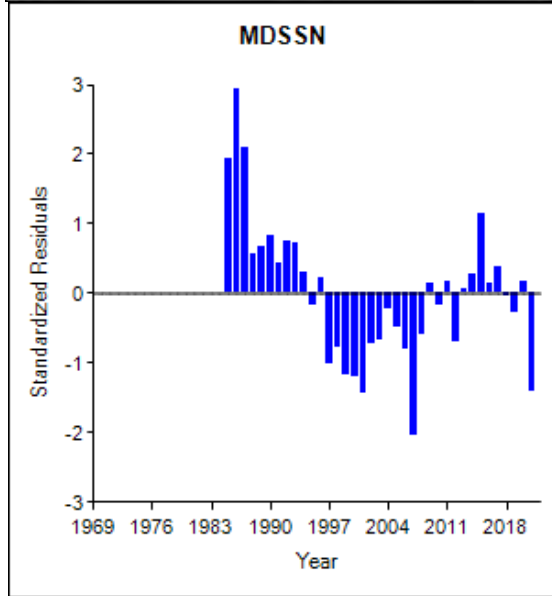
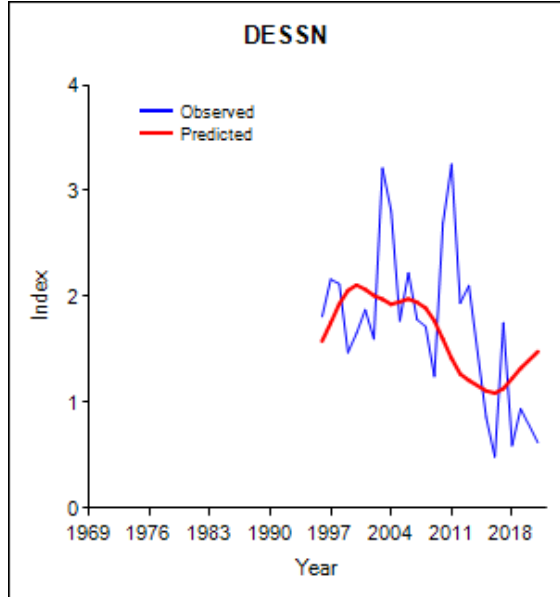
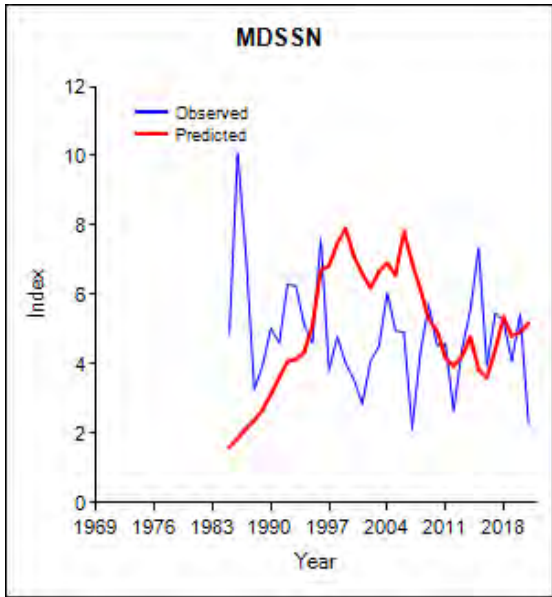
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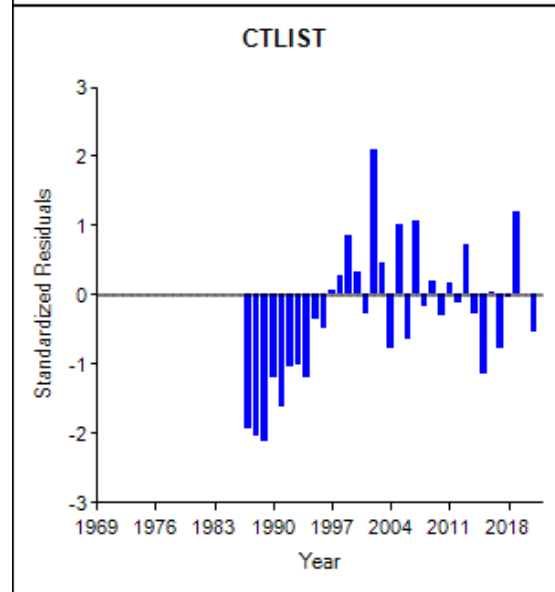
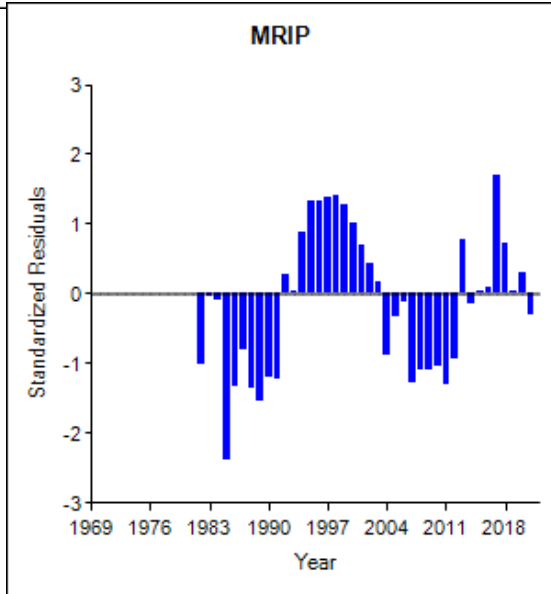
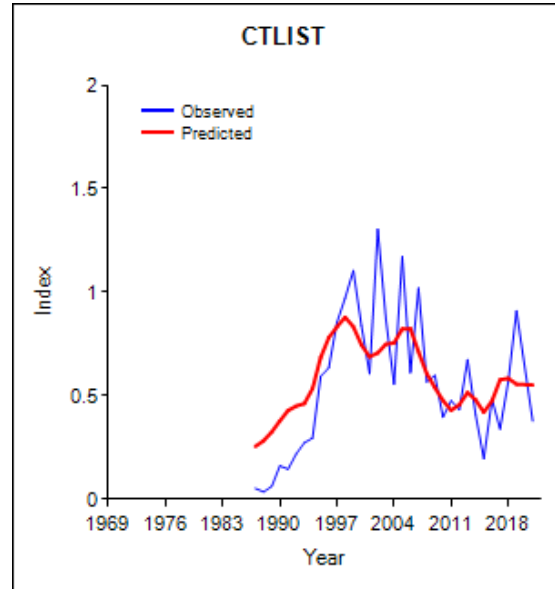
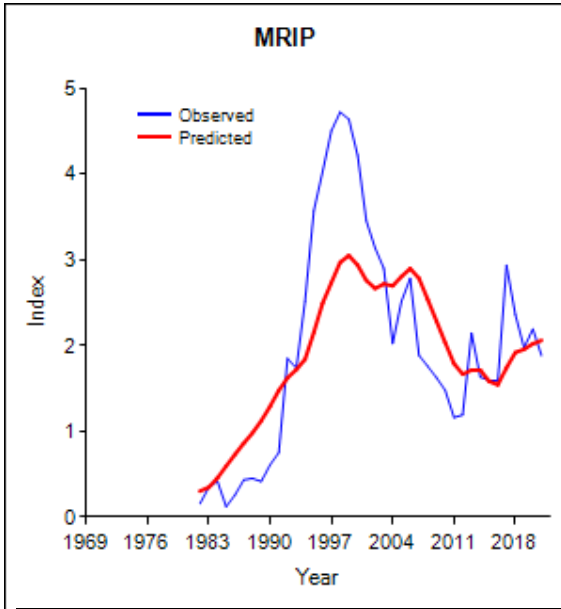
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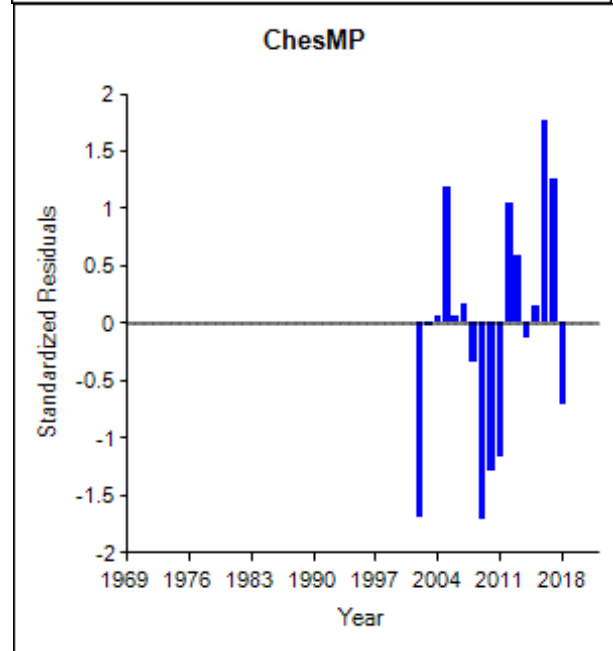
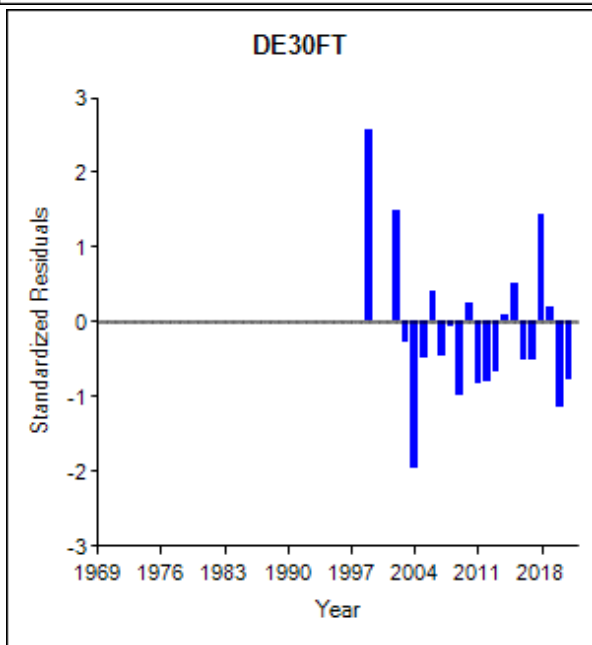
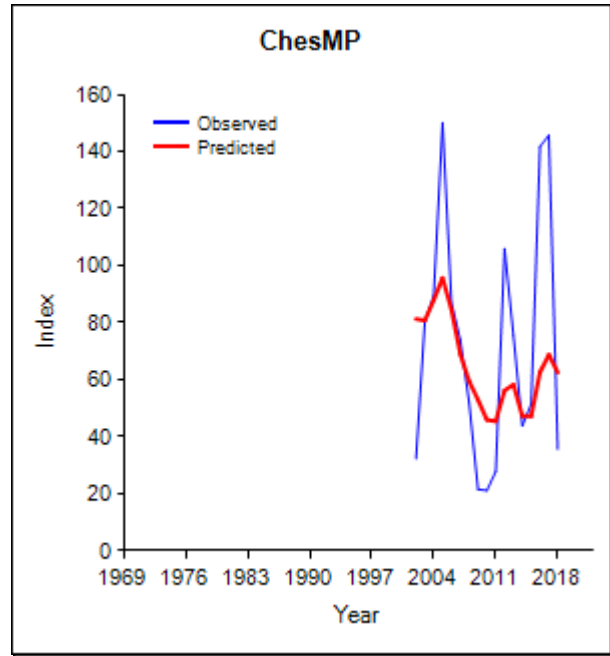
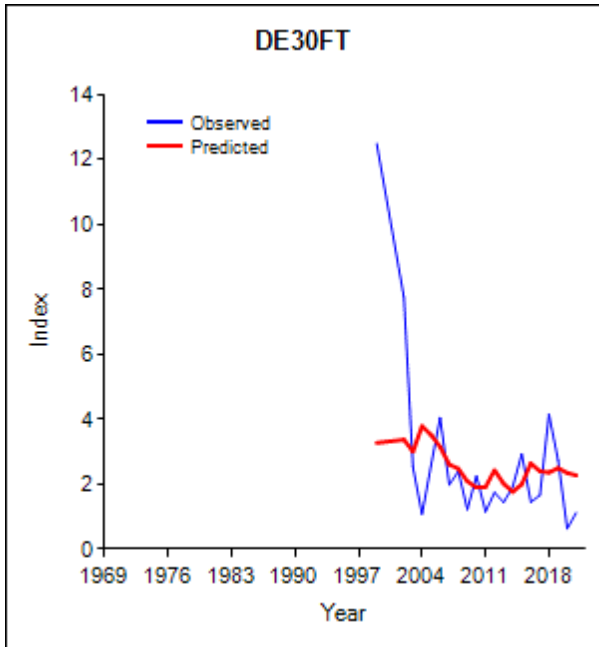
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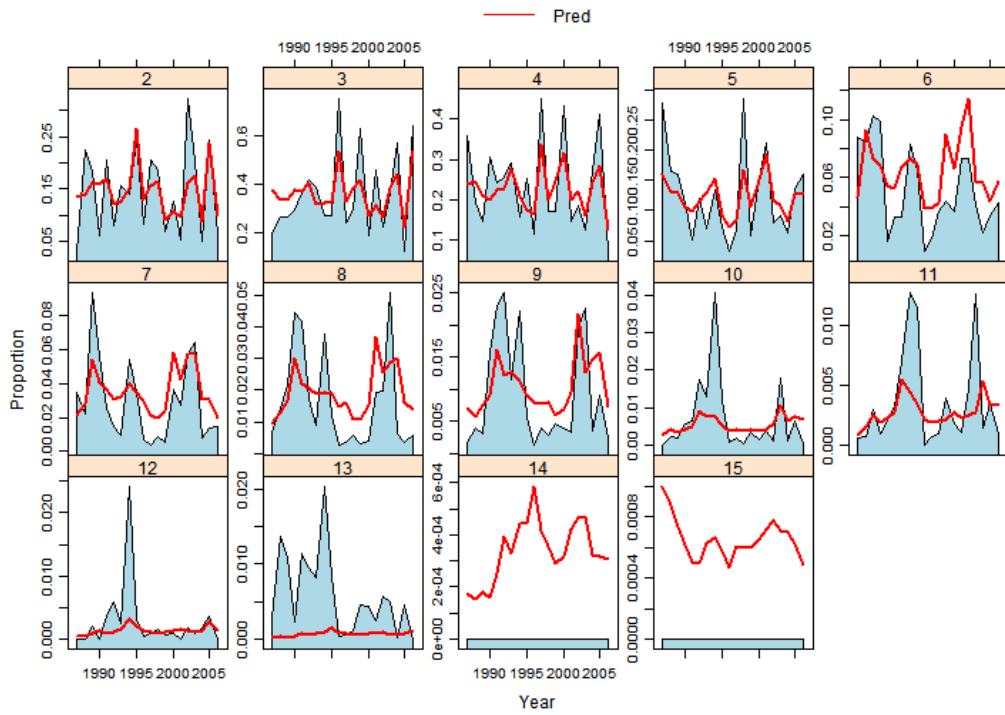
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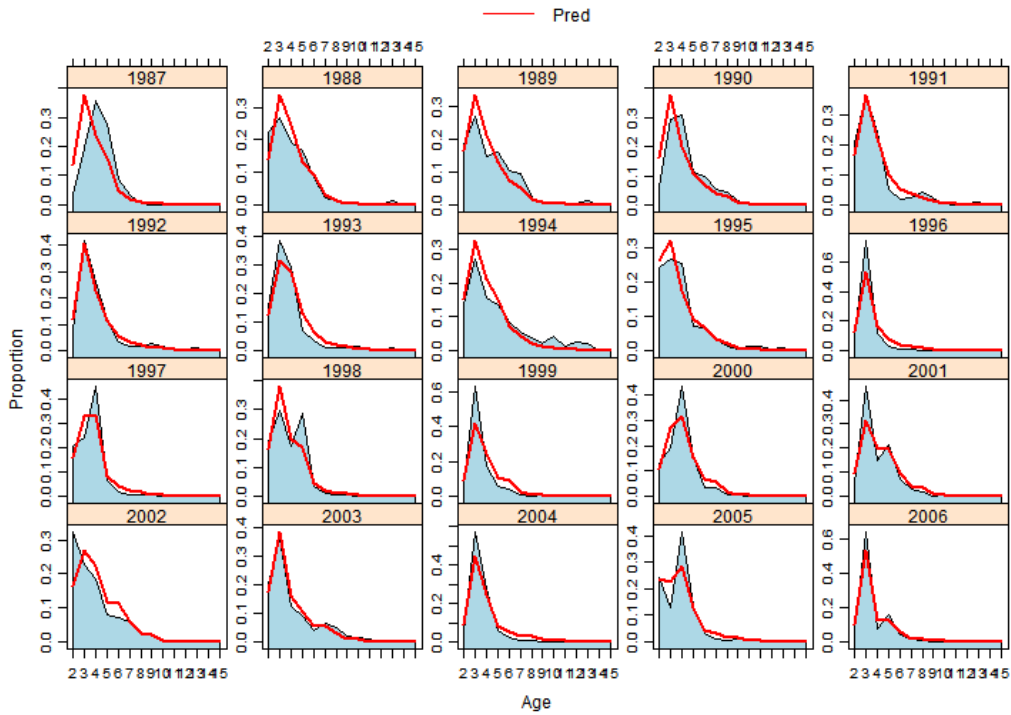
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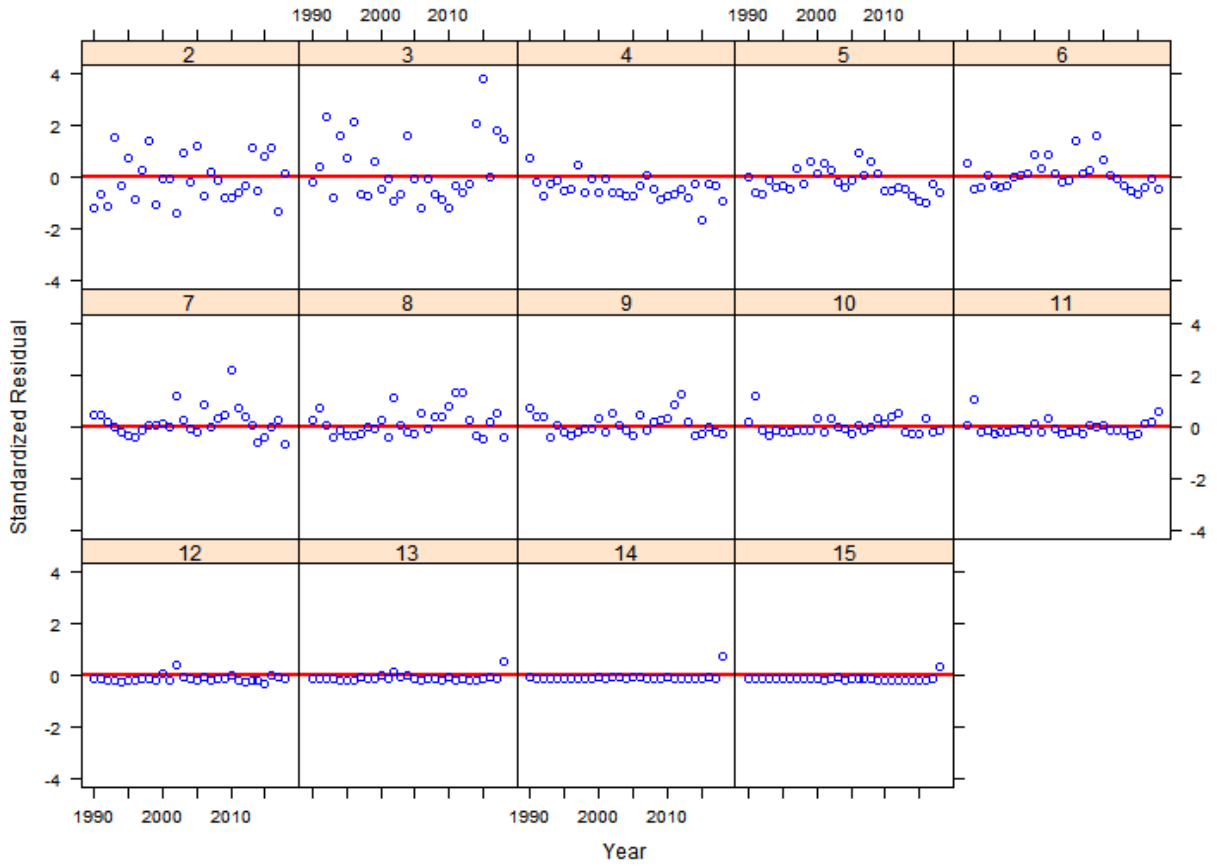
NYOHS Age Composition By Age



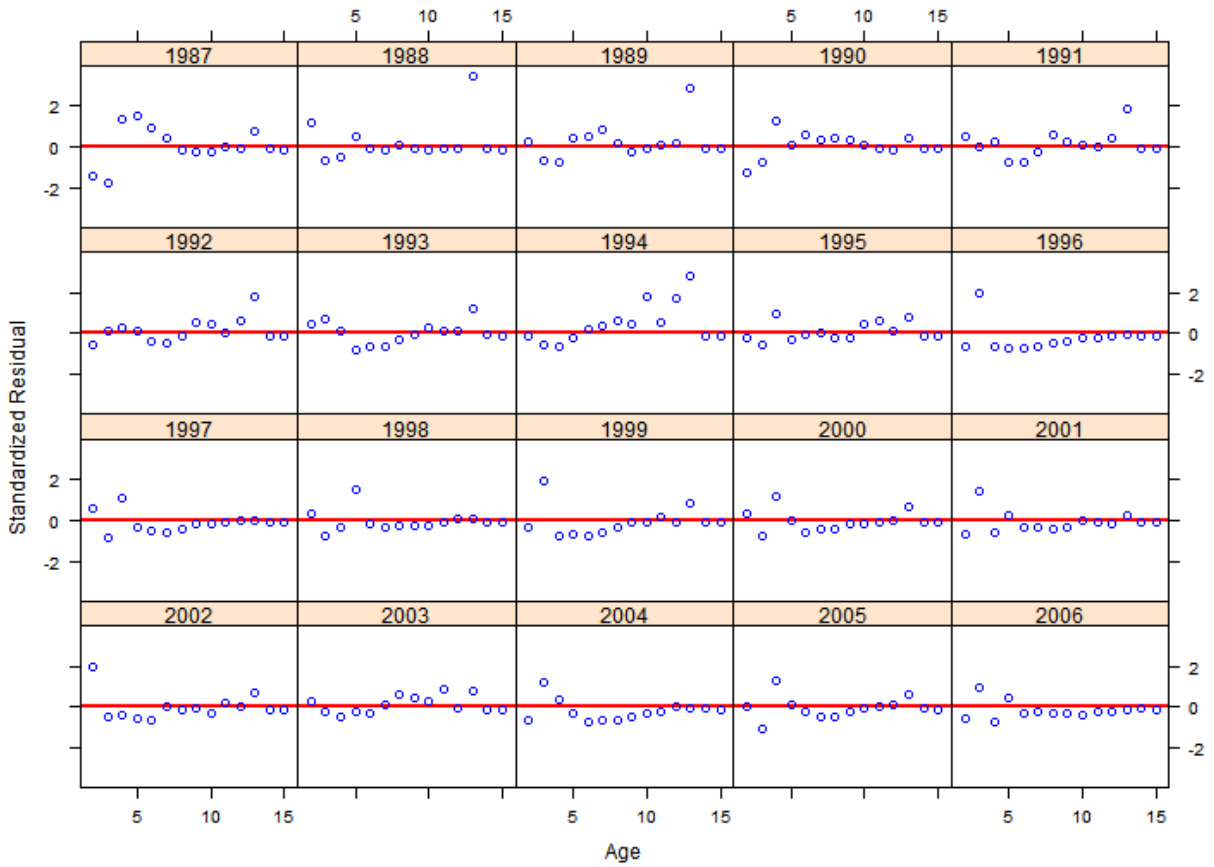
NYOHS Age Composition By Year



Draft for Board Review NJ Trawl Age Residuals By Age

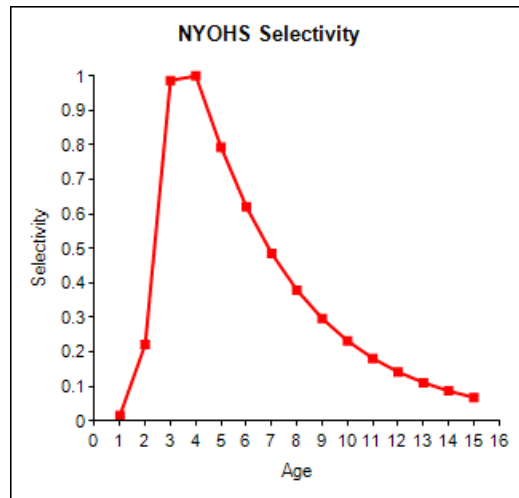
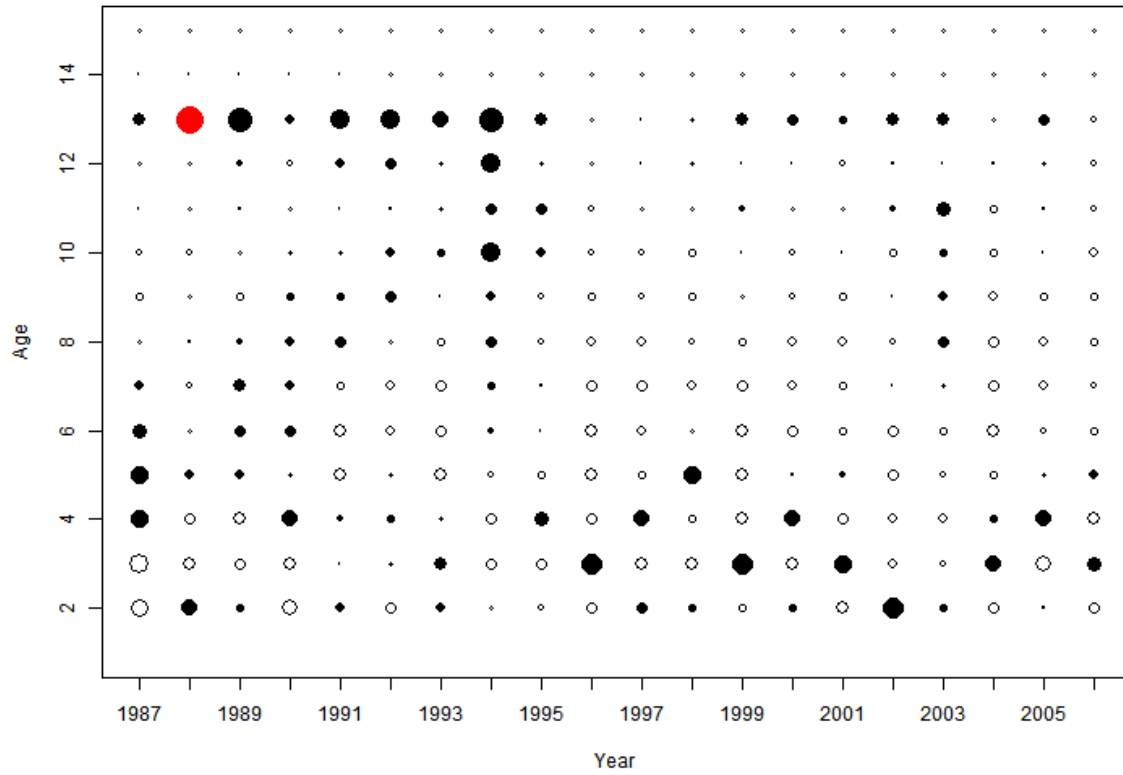


NYOHS Age Residuals By Year



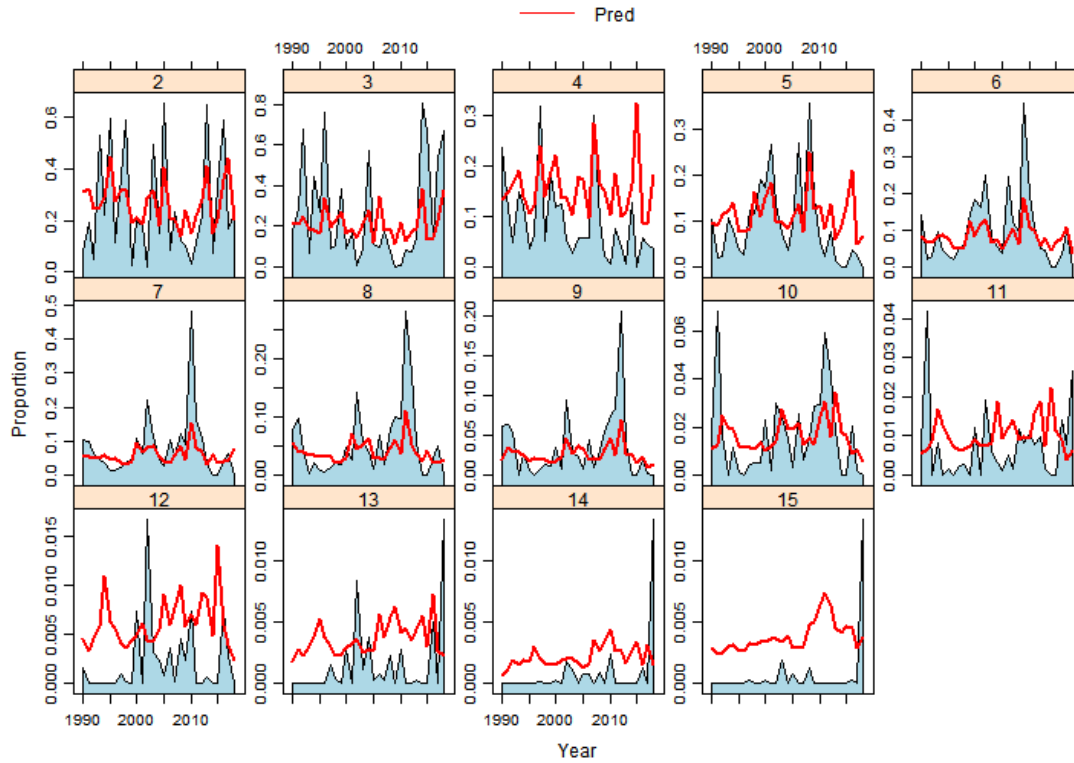
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NYOHS Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)

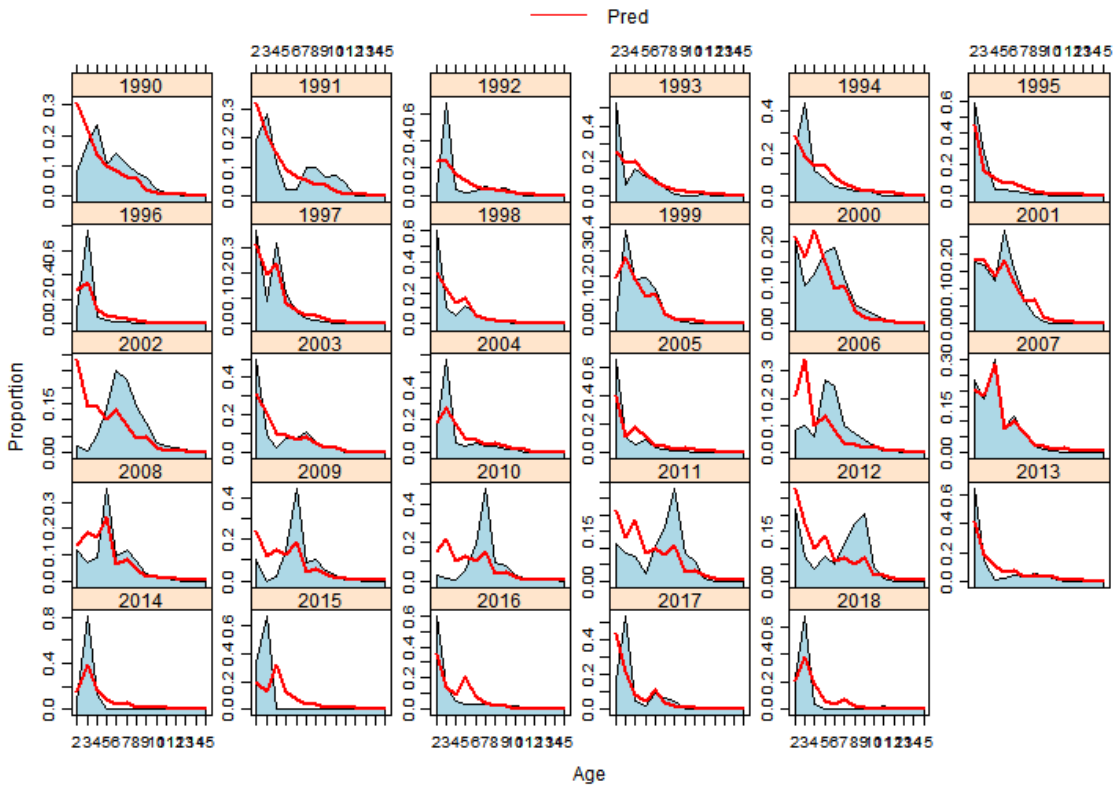


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NJ Trawl Age Composition By Age

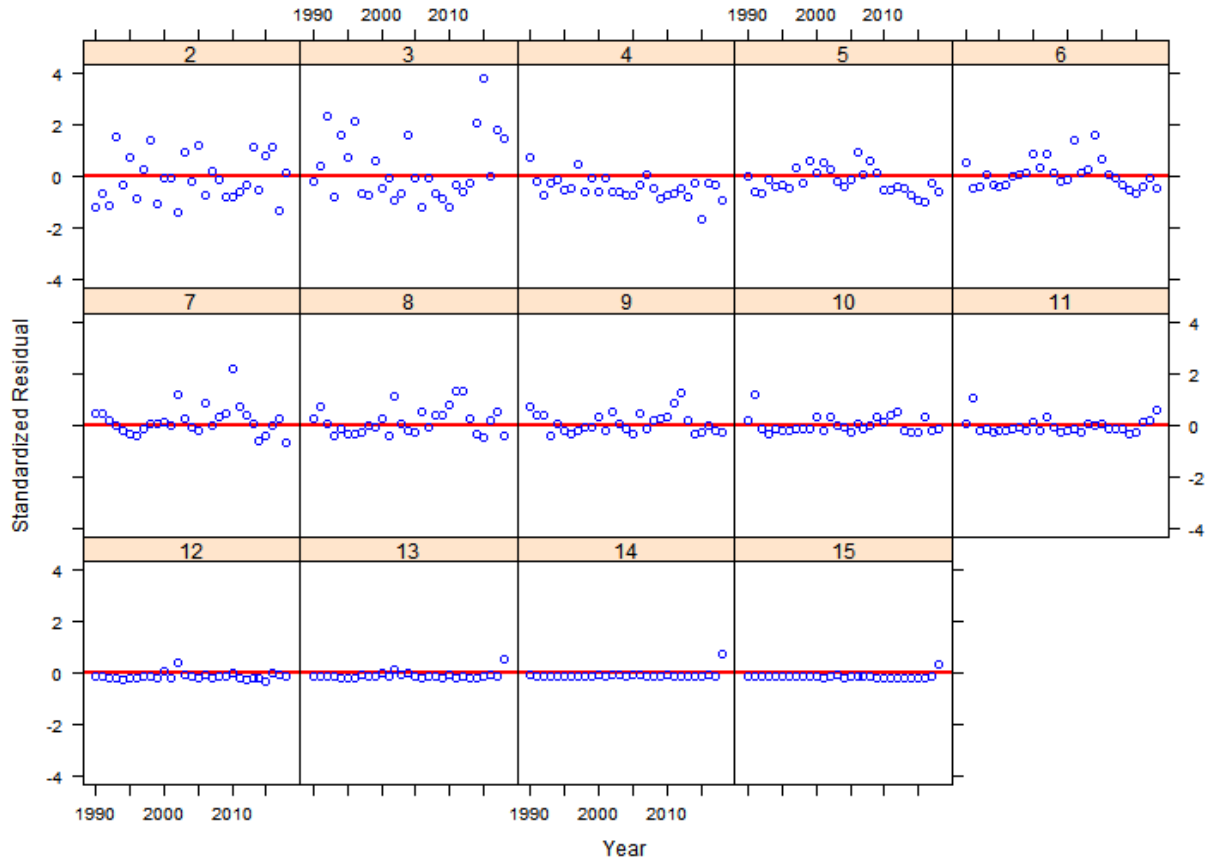


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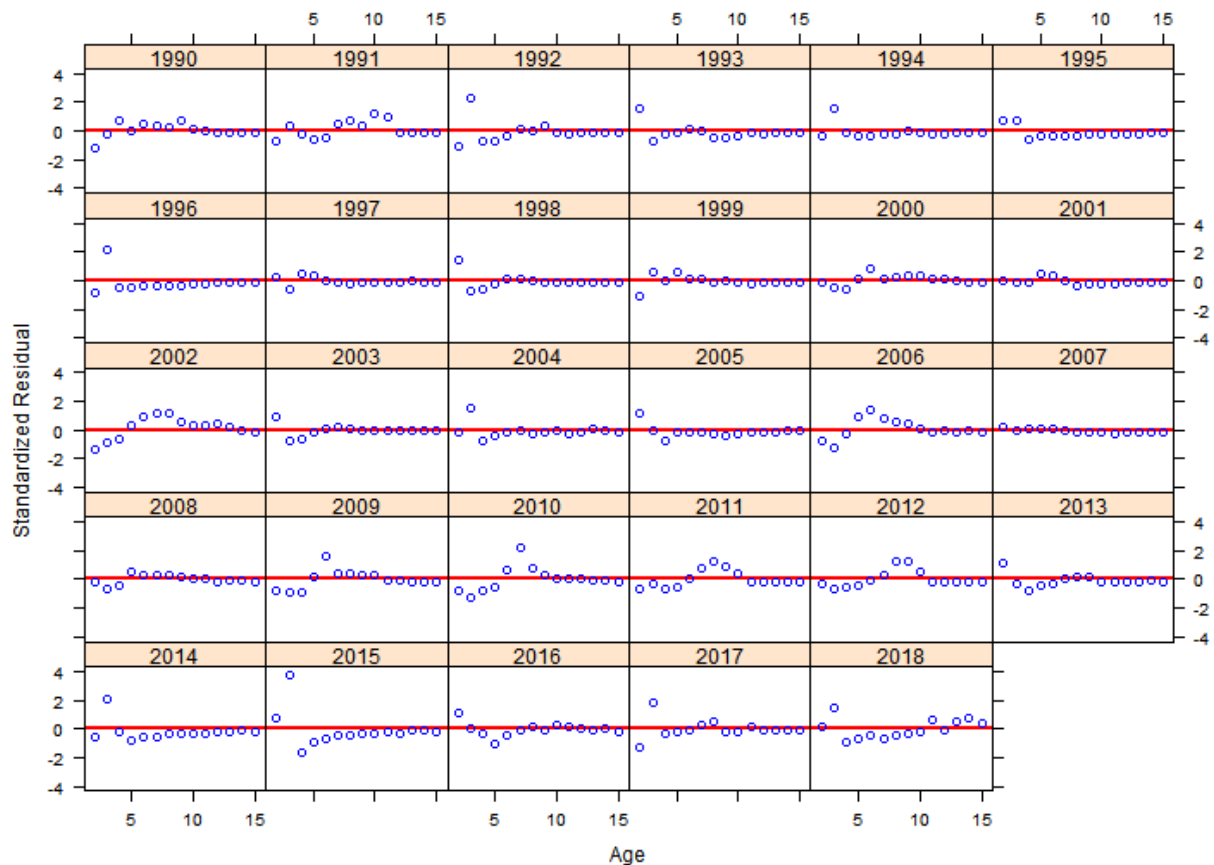


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NJTrawl Age Residuals By Age

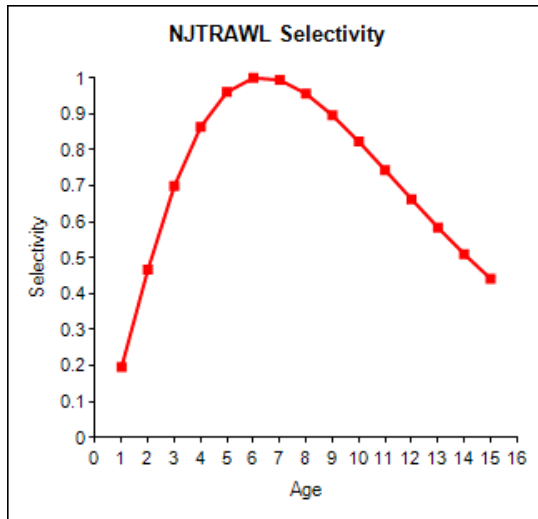
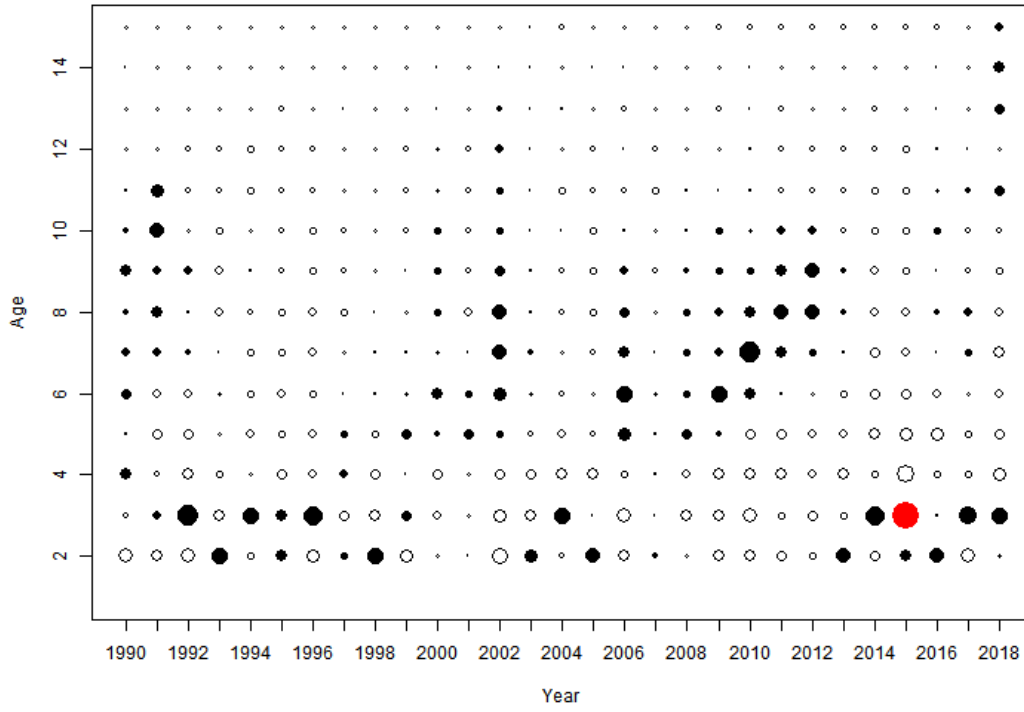


NJTrawl Age Residuals By Year



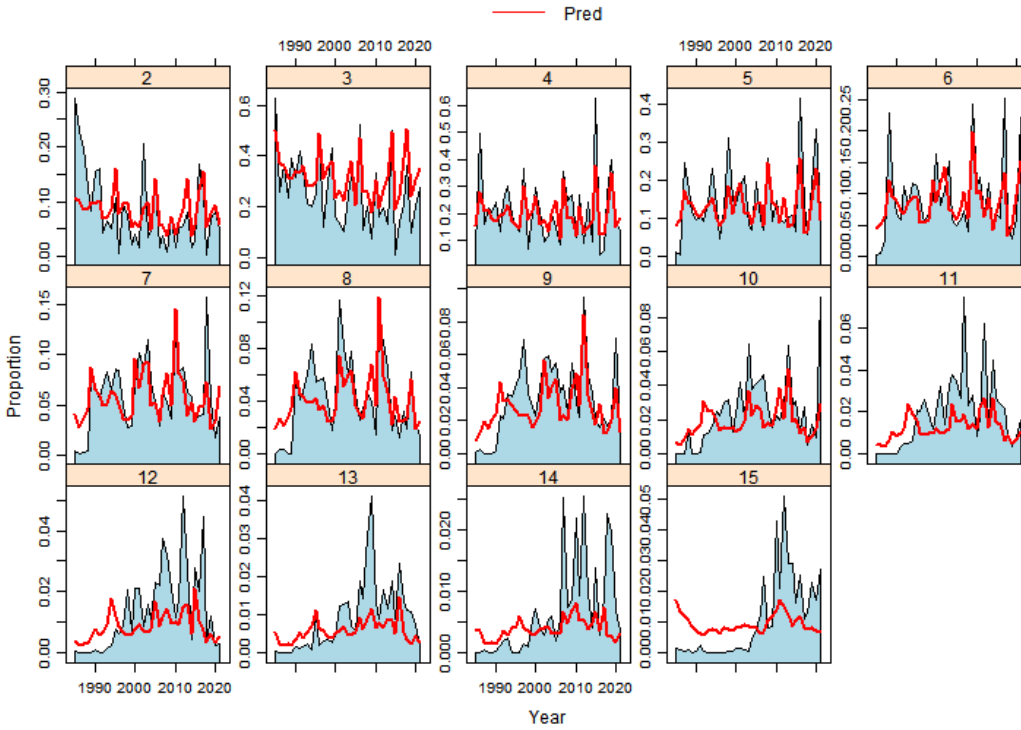
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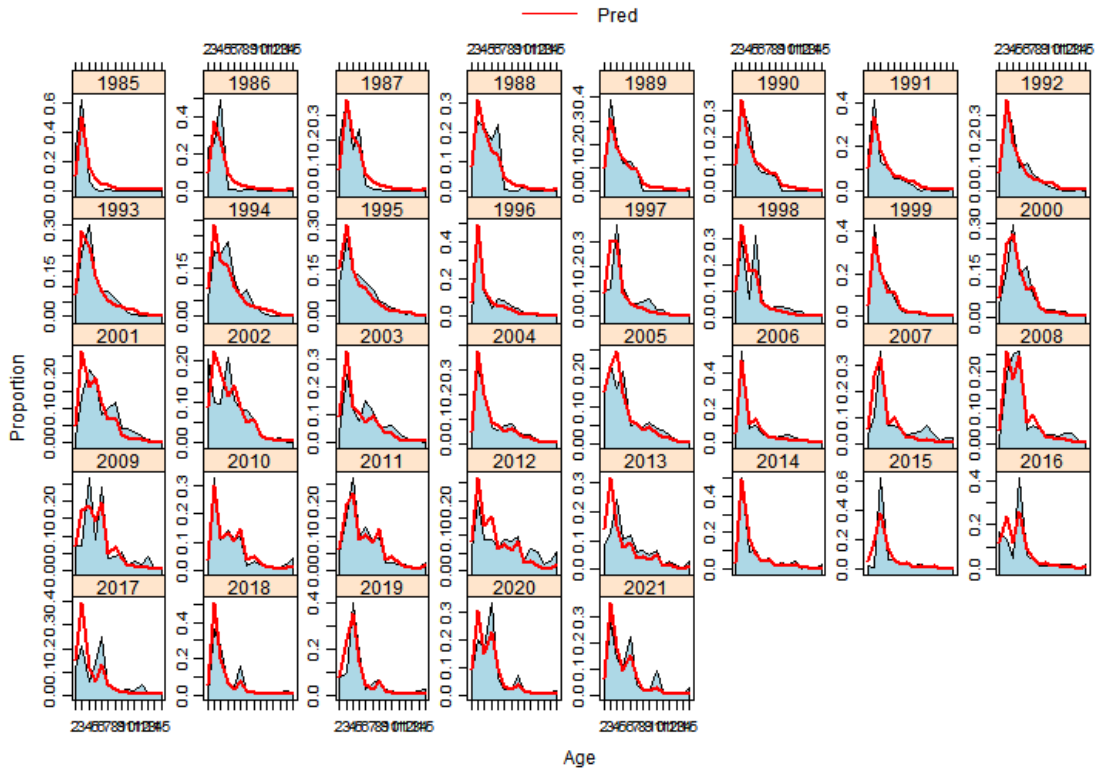


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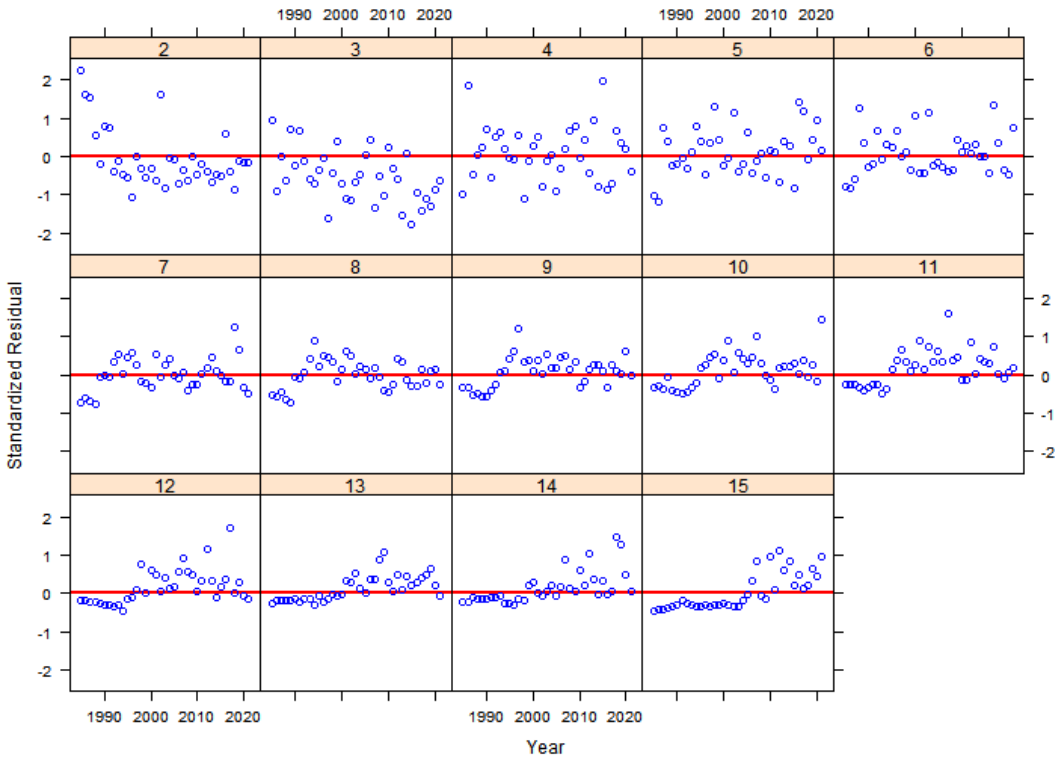


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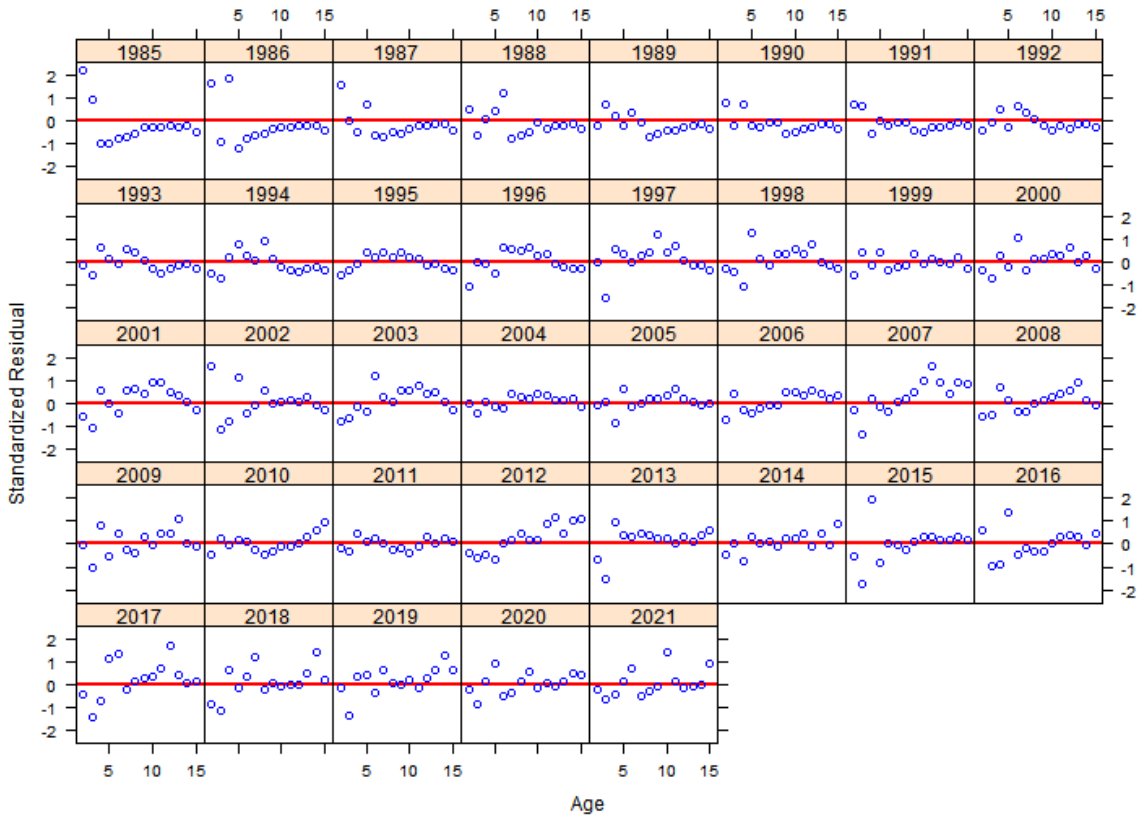


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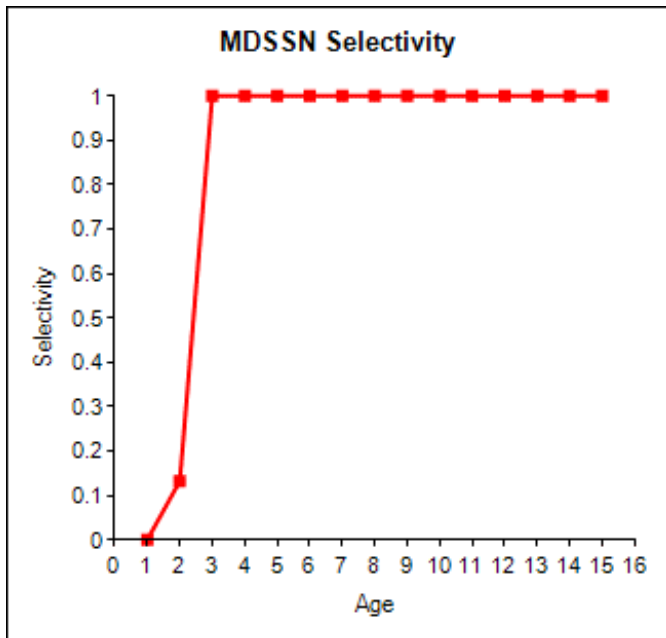
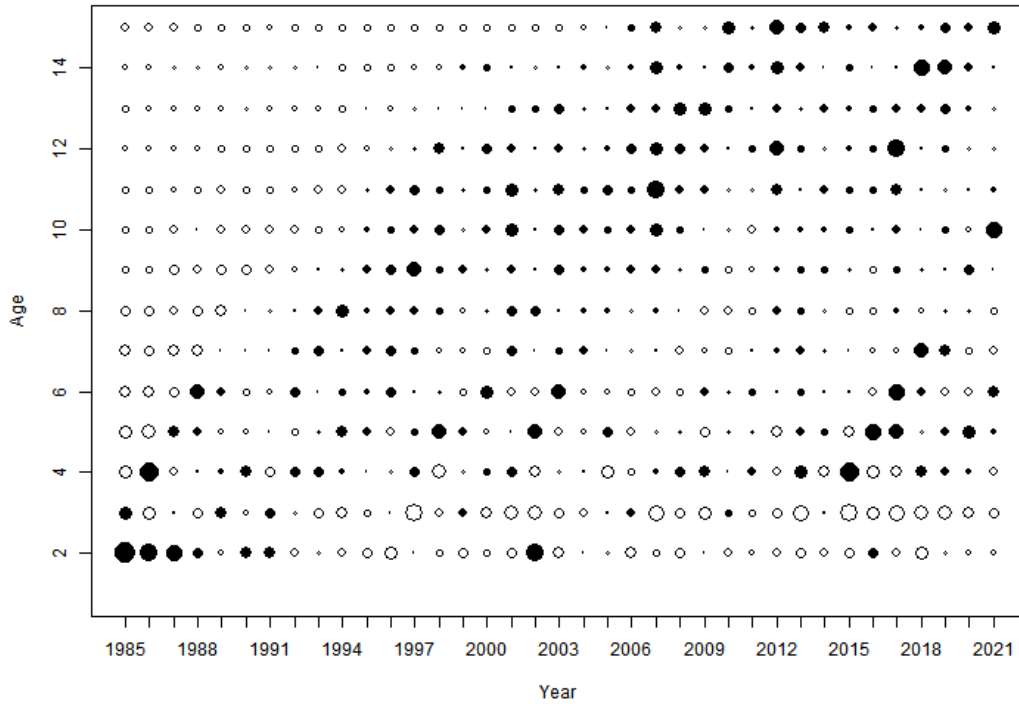


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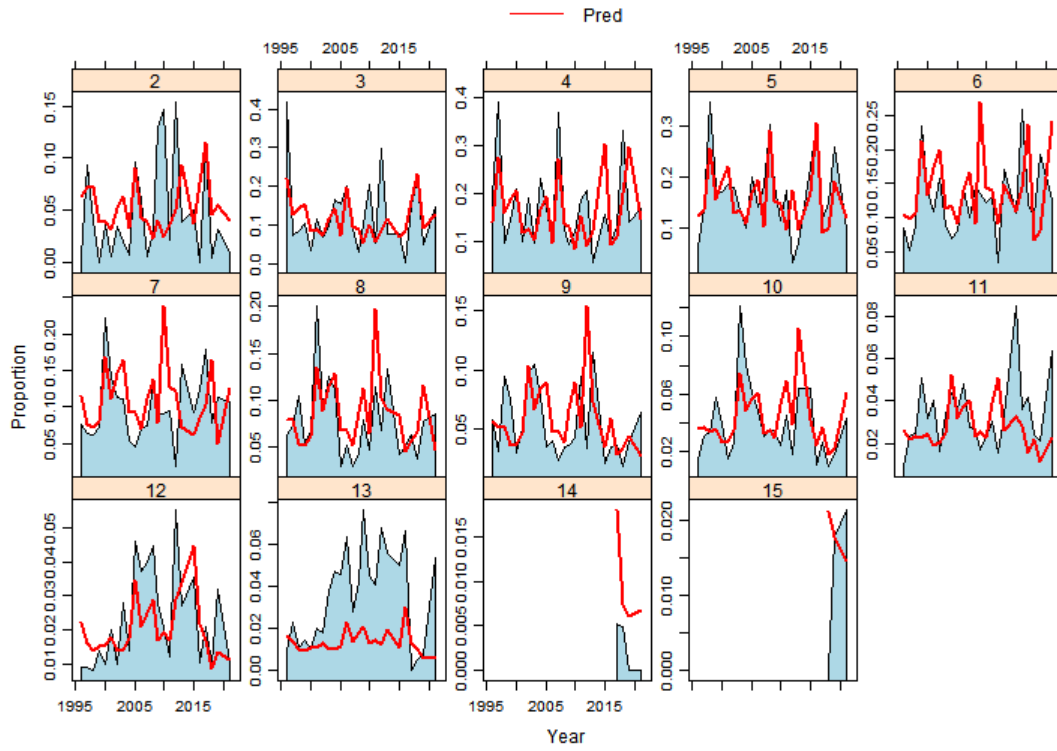
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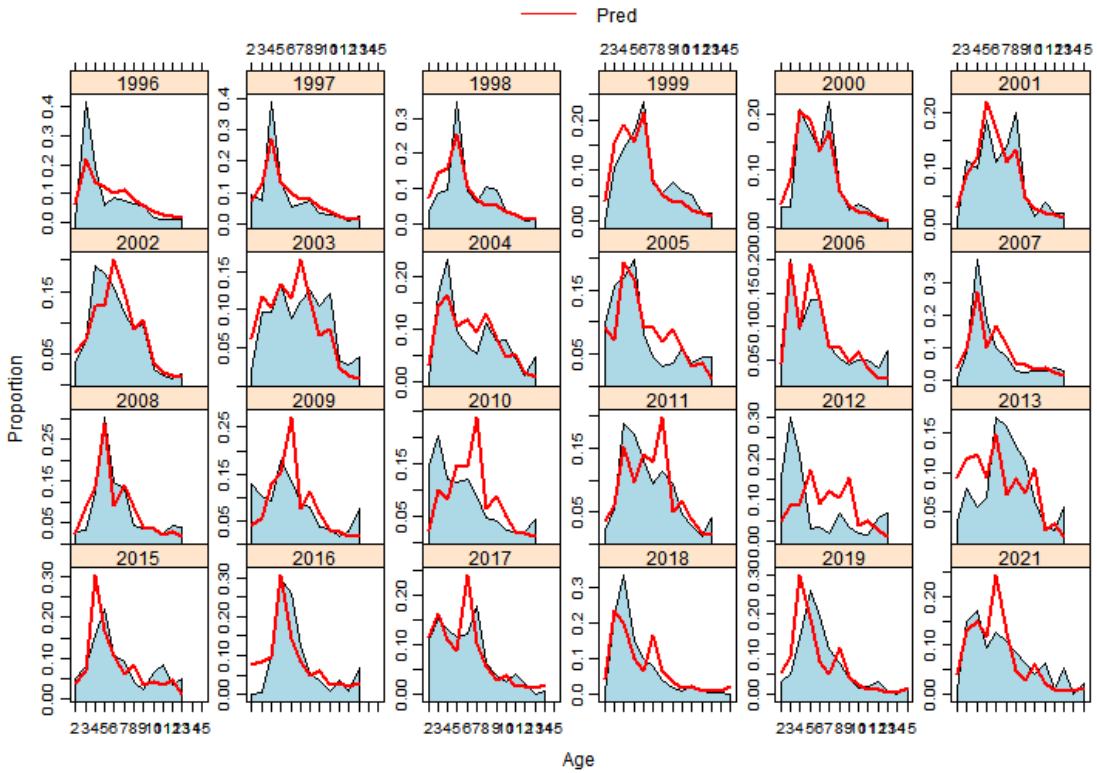


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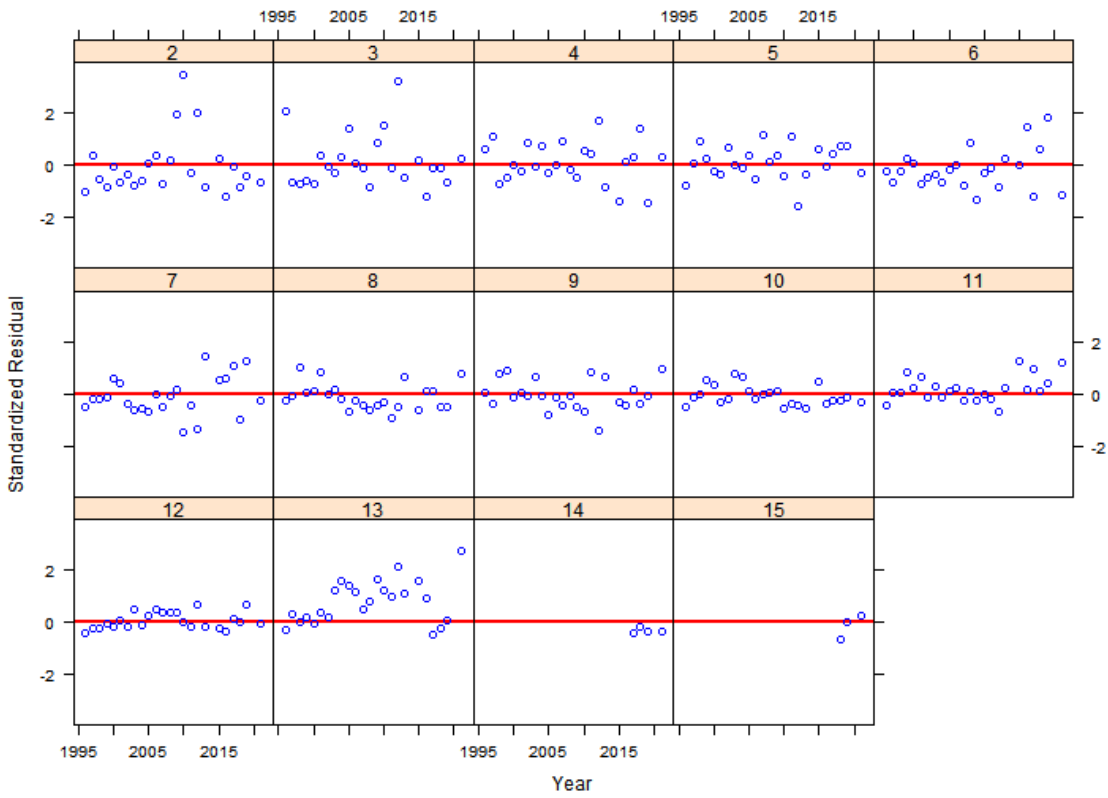
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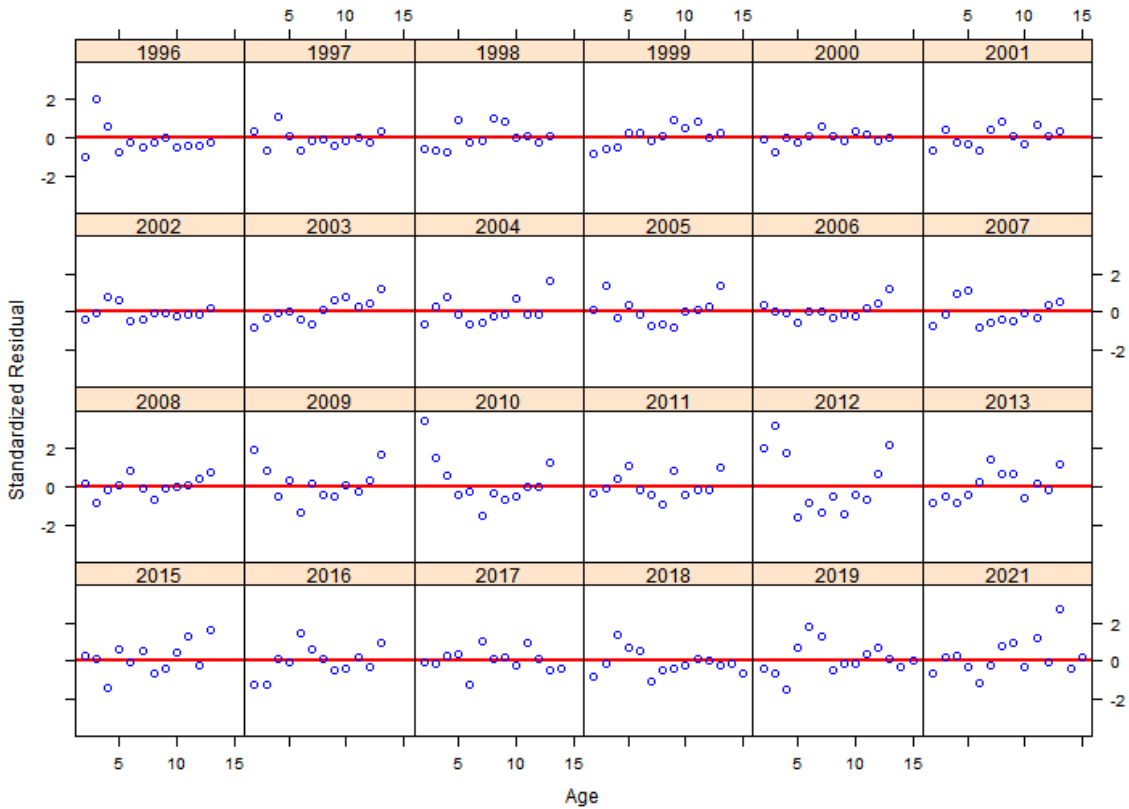
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DESSN Age Residuals By Age

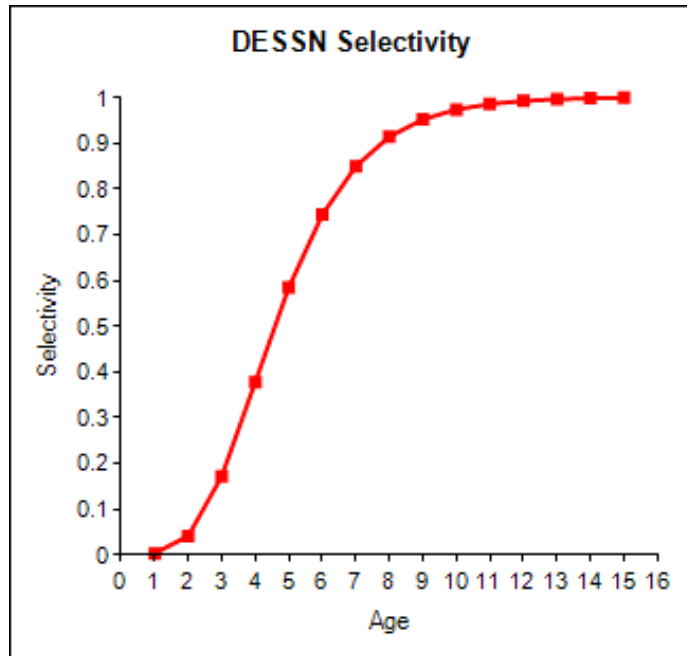
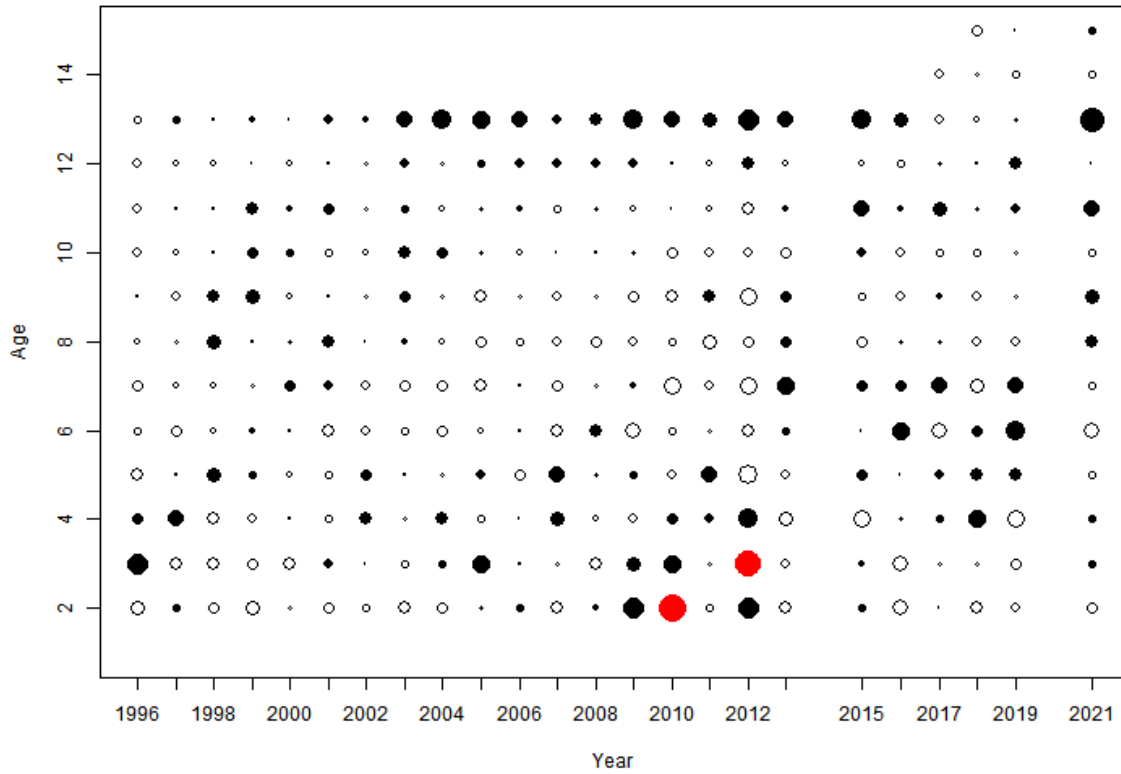


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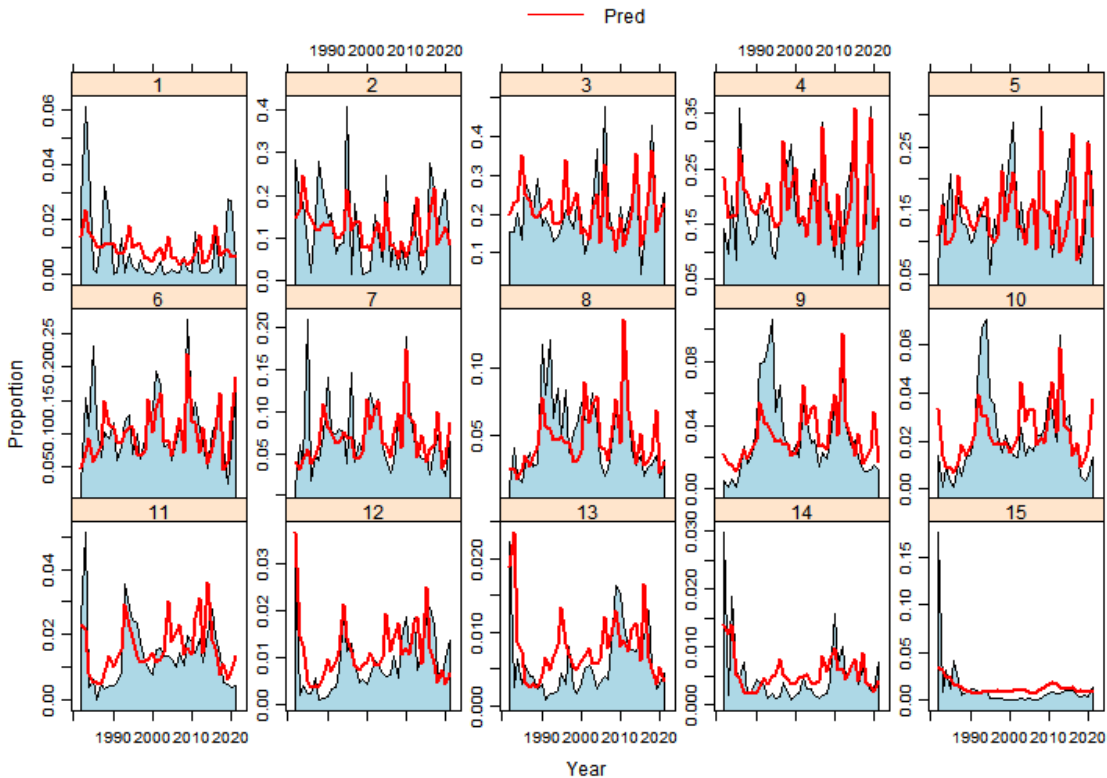


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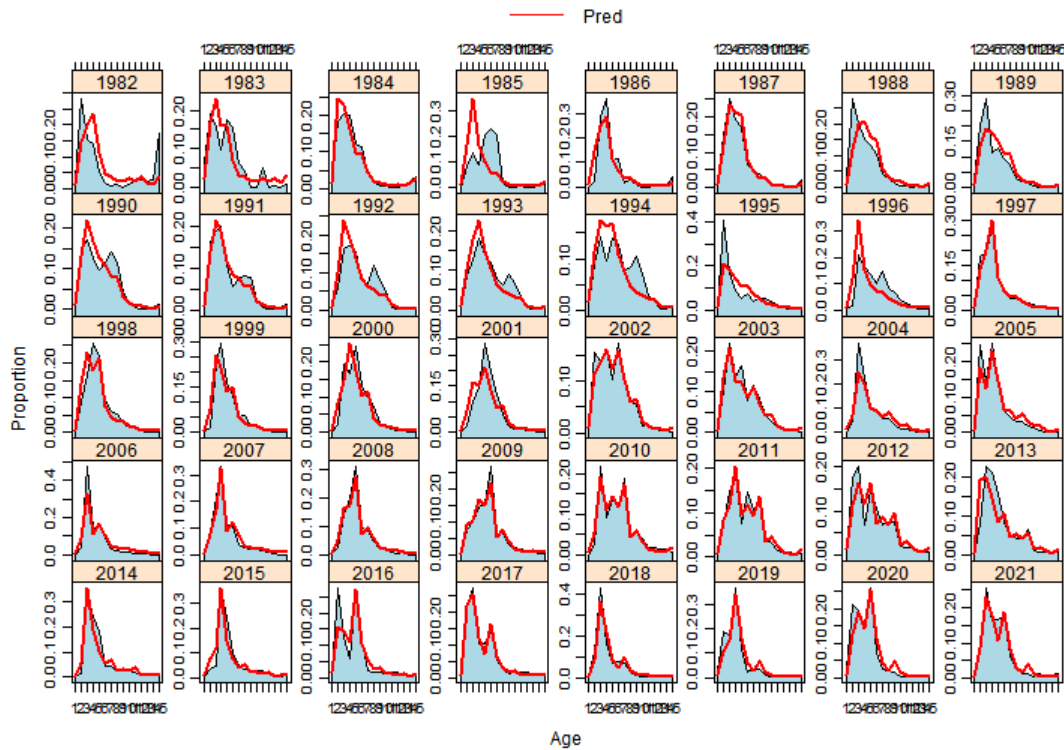
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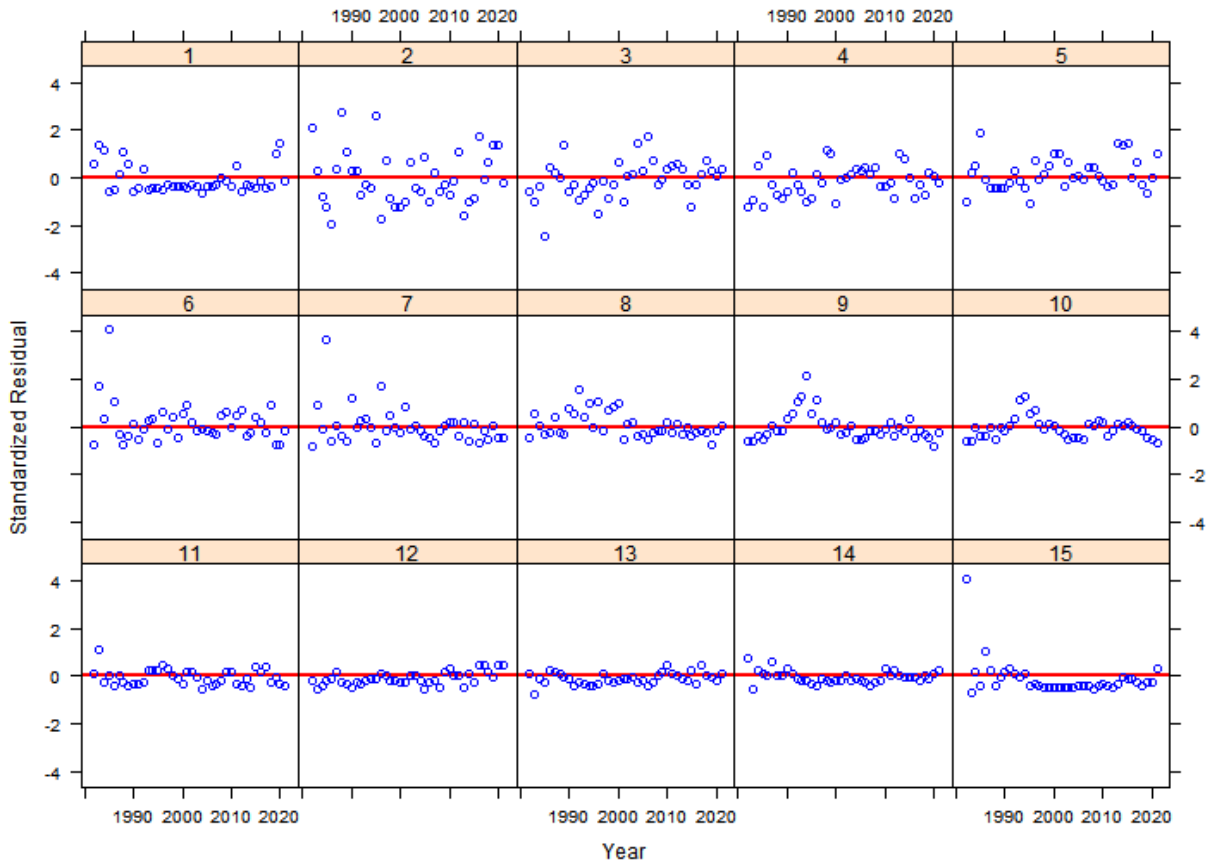
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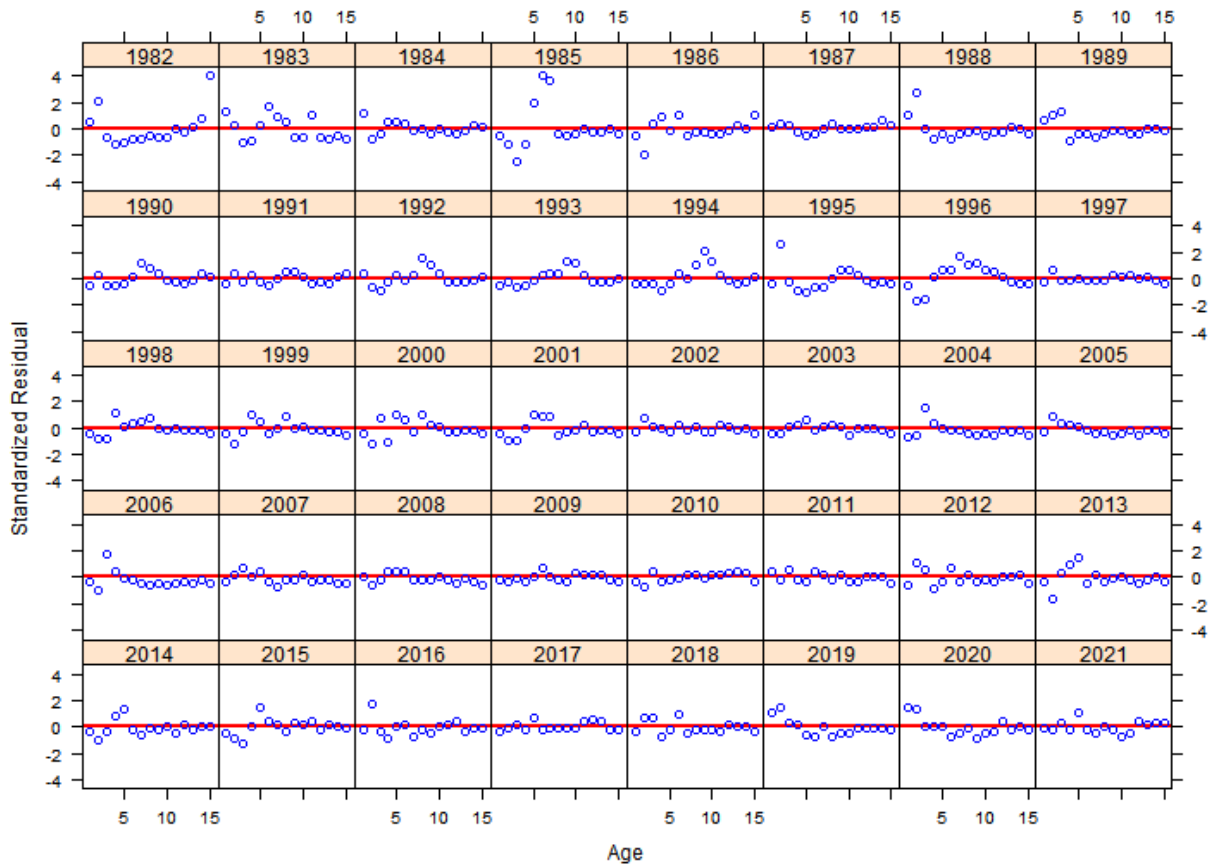
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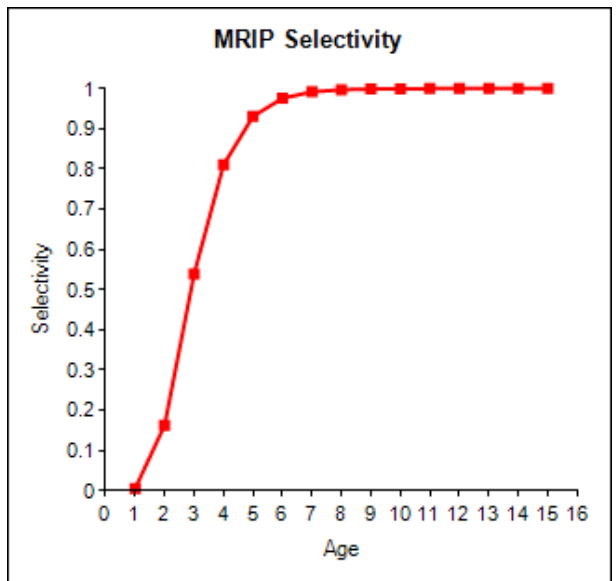
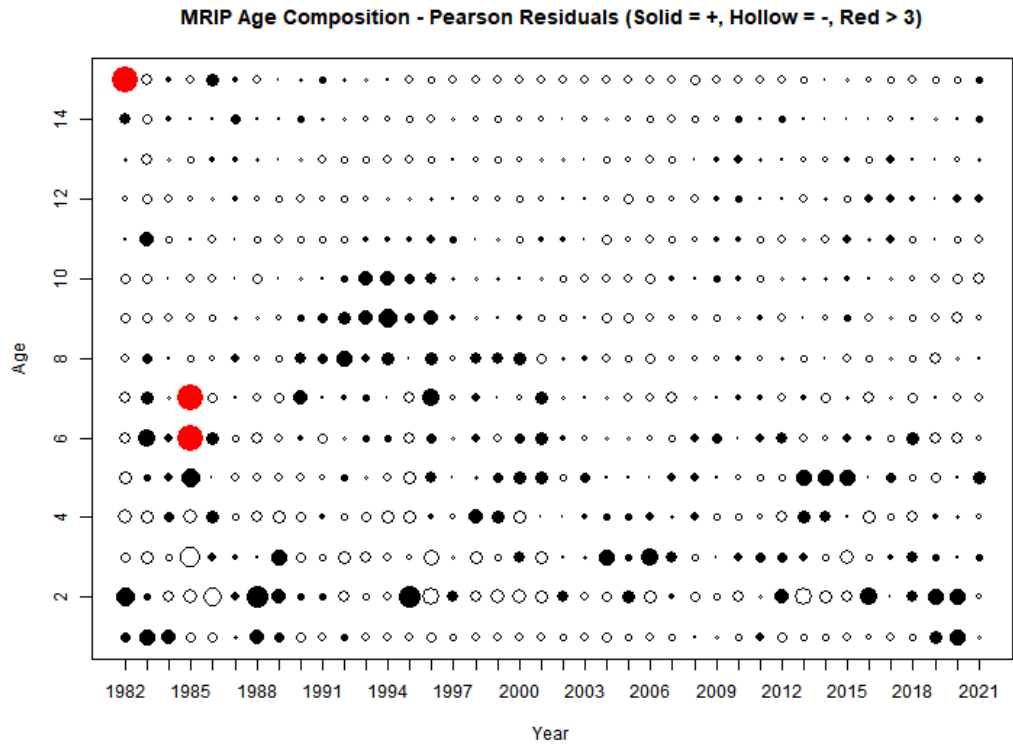
MRIP Age Residuals By Age



MRIP Age Residuals By Year

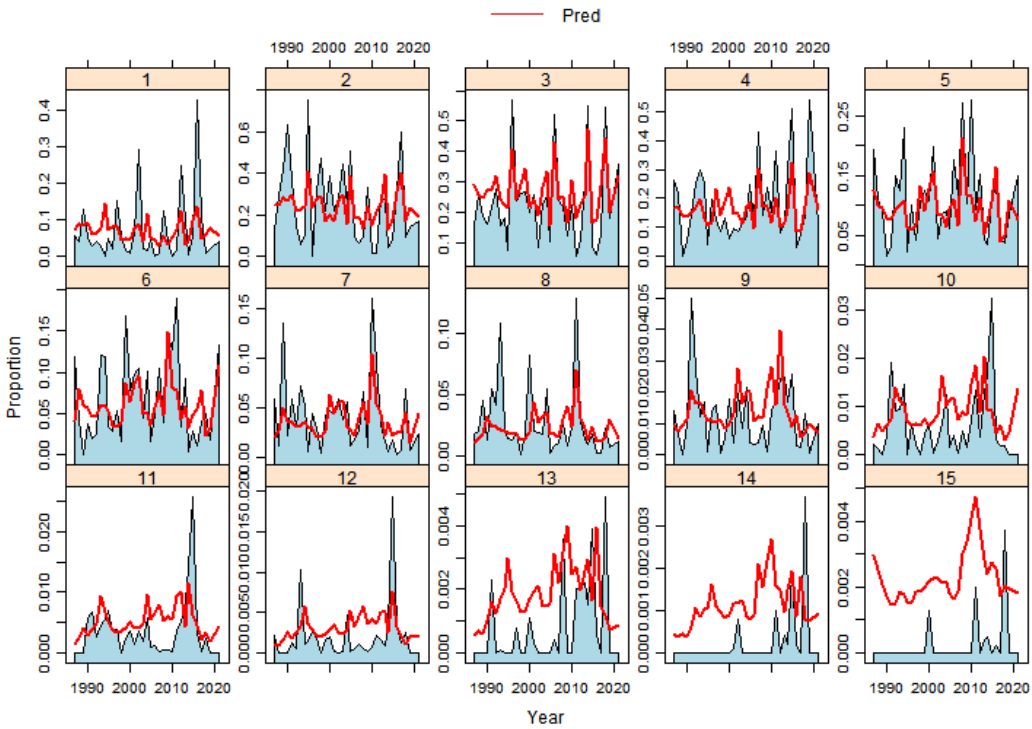


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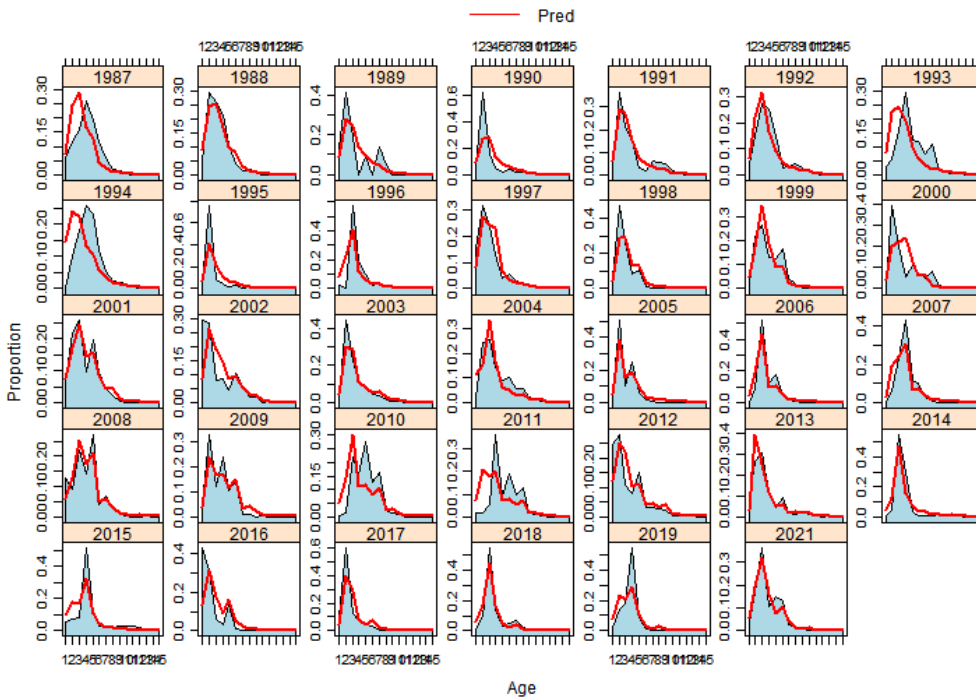


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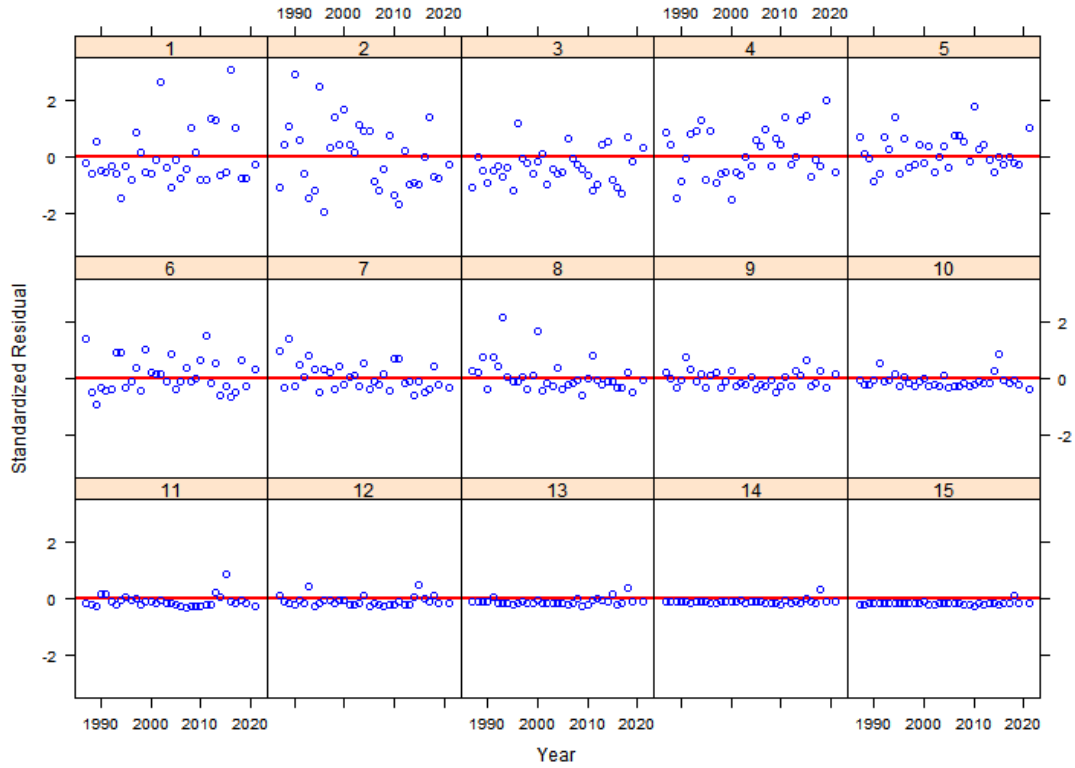
CTLIST Age Composition By Age



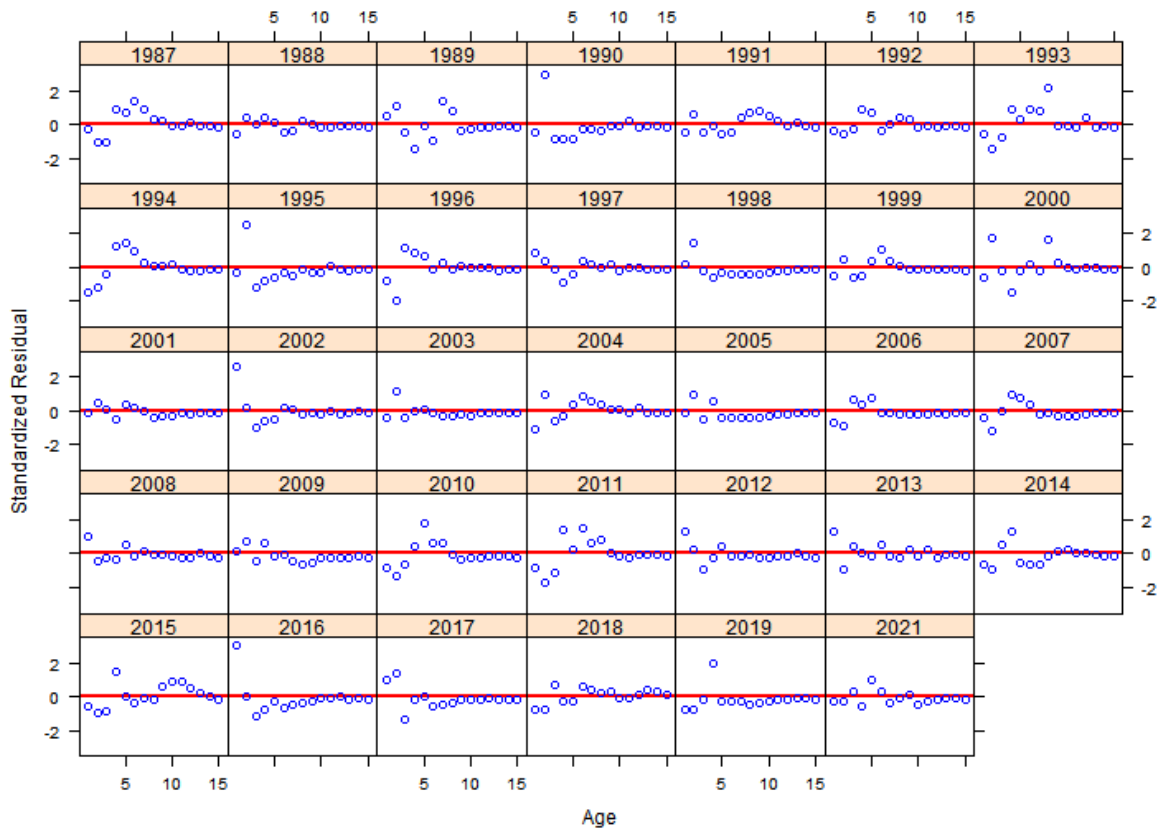
CTLIST Age Composition By Year



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CTLIST Age Residuals By Age

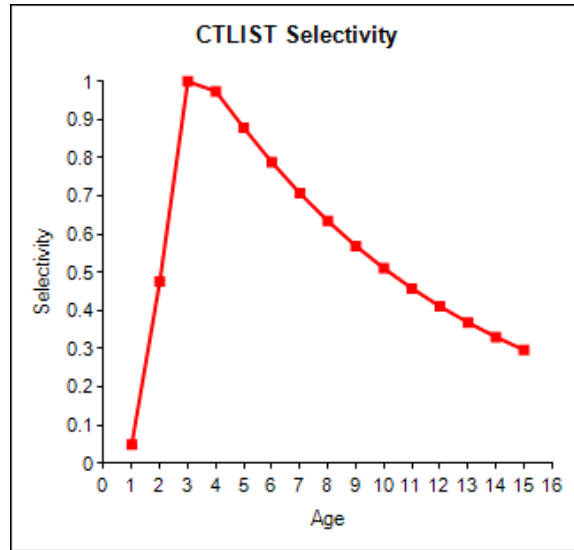
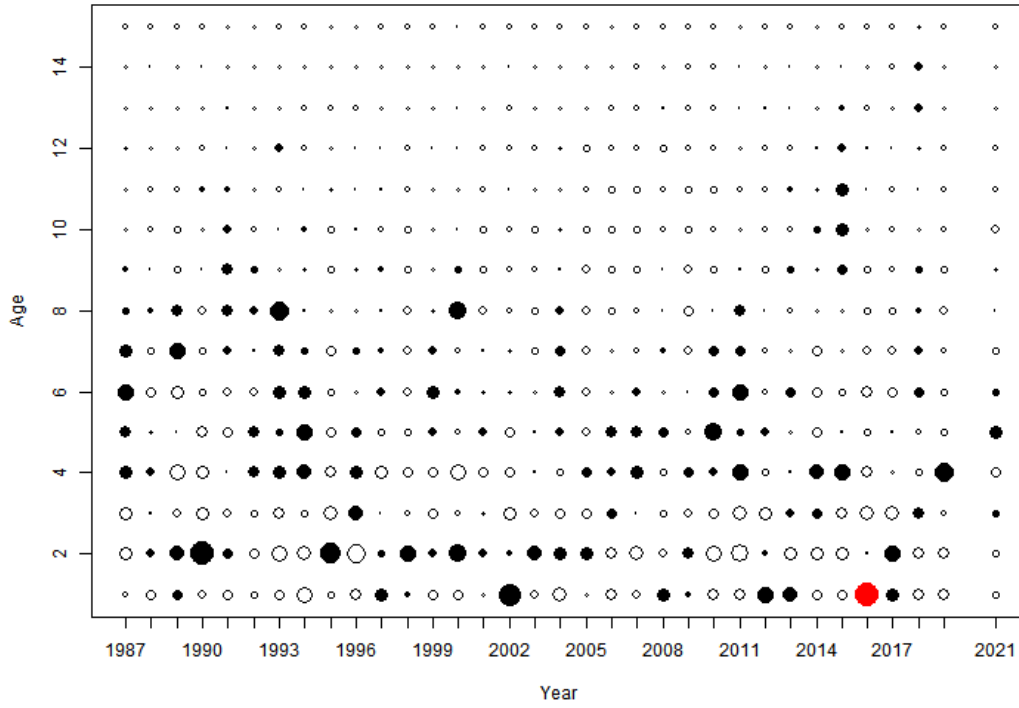


CTLIST Age Residuals By Year

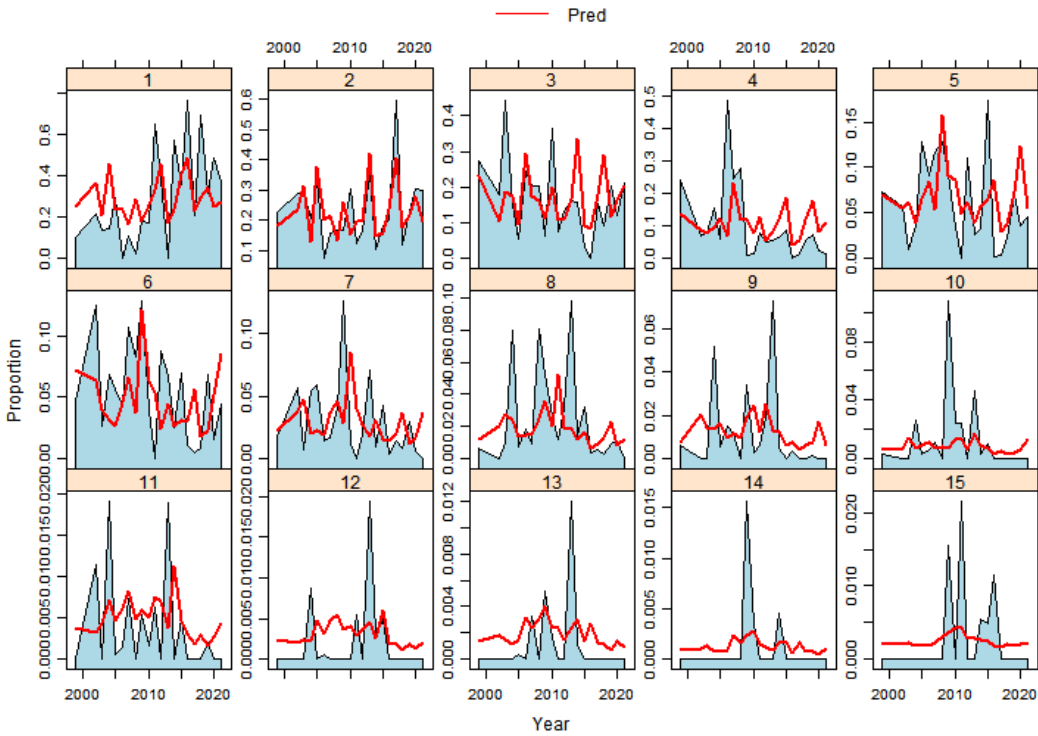


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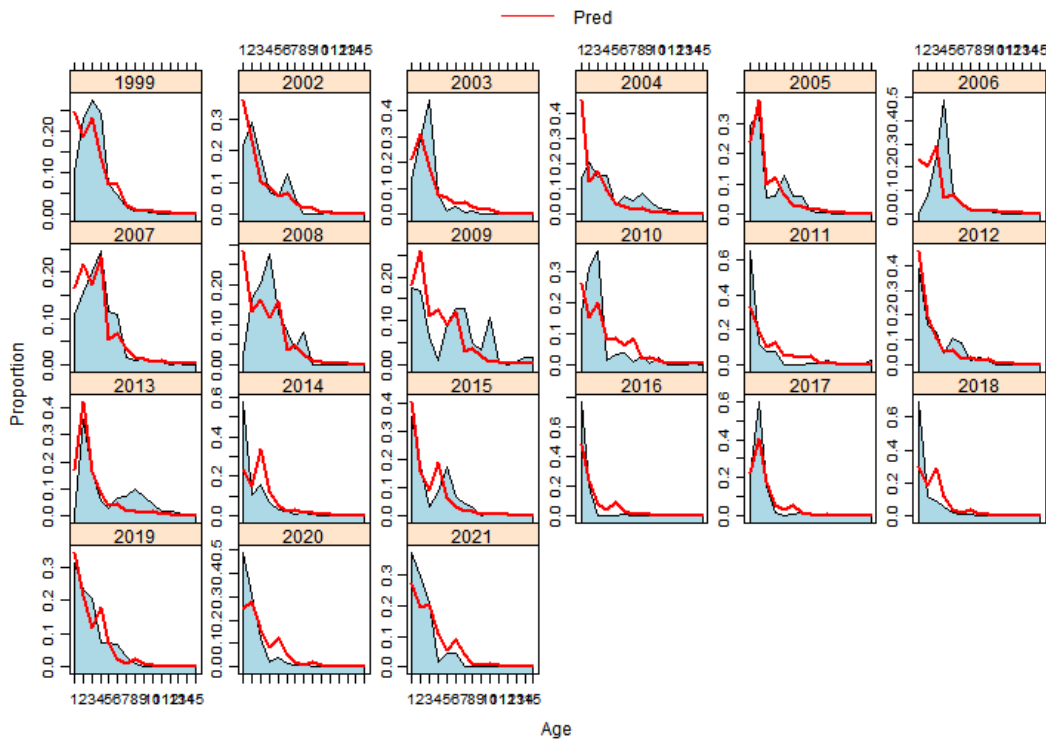
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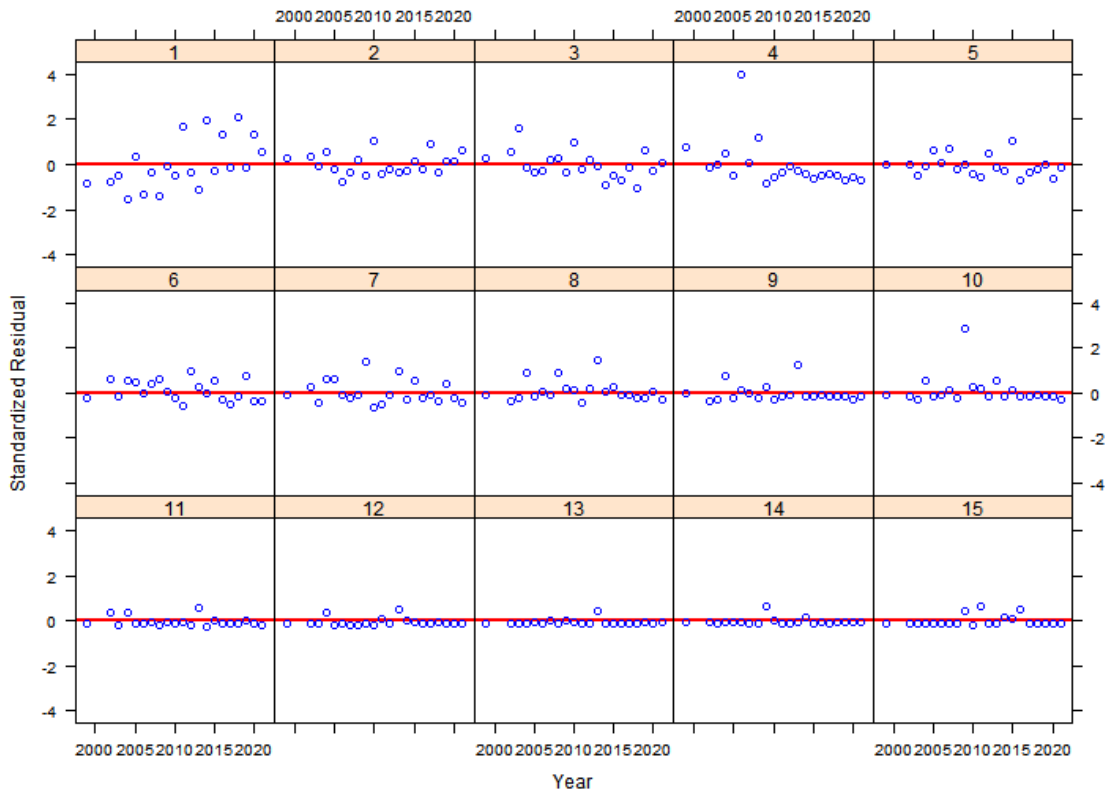
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DE30FT Age Composition By Age



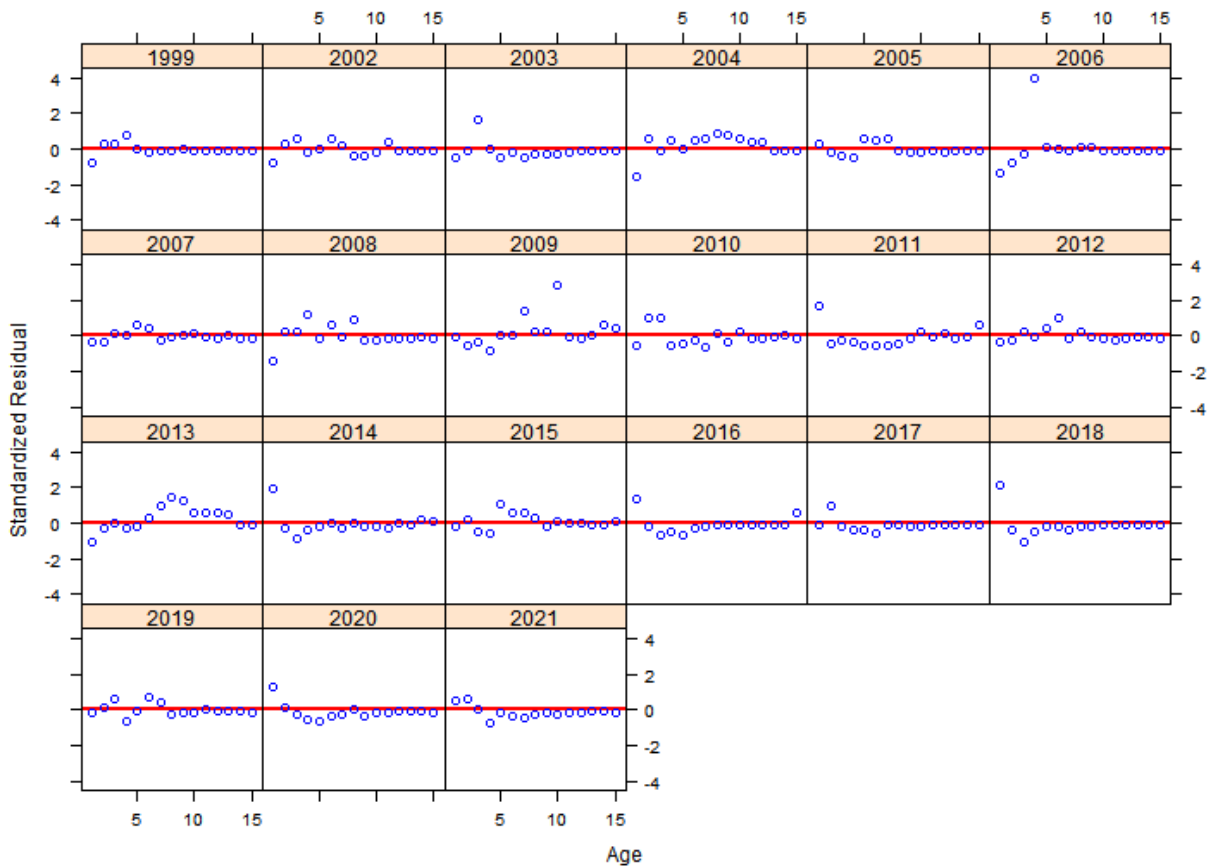
DE30FT Age Composition By Year



DE30FT Age Residuals By Age

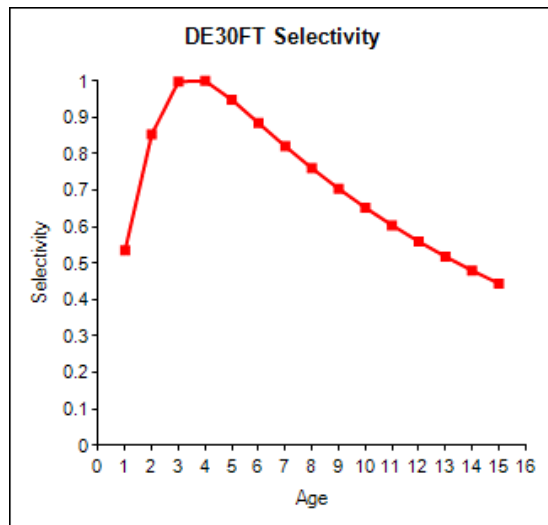
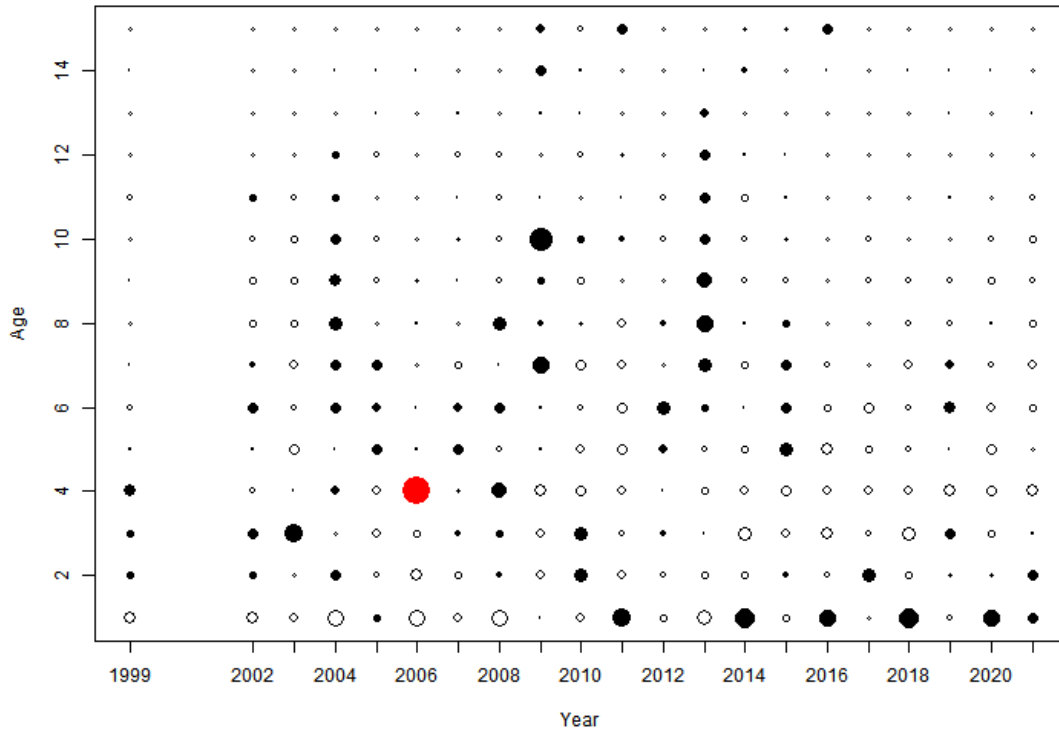


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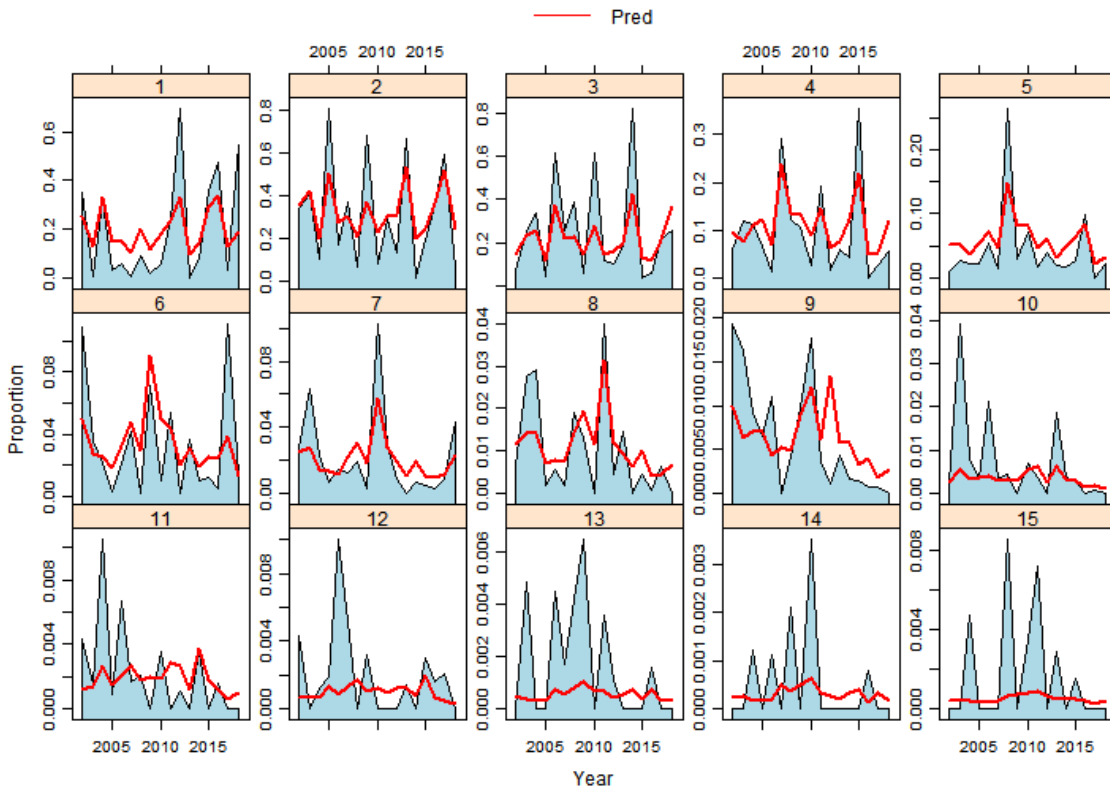
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DE30FT Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)

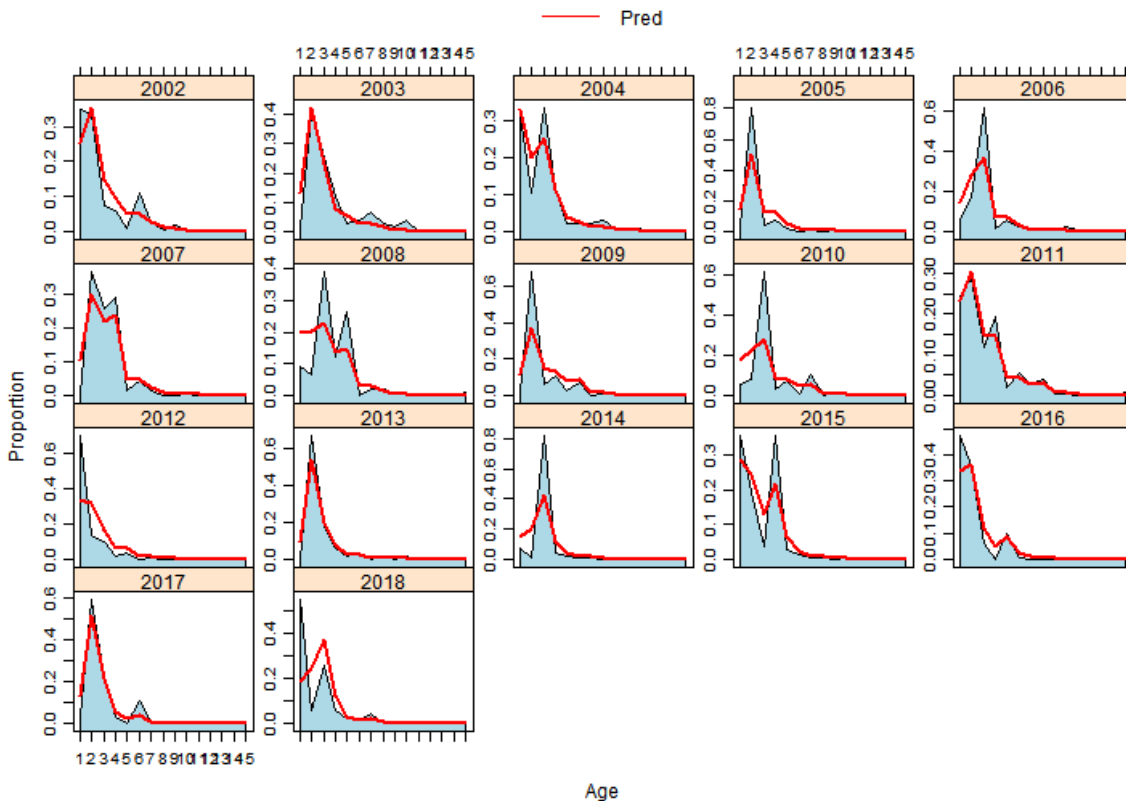


Draft for Board Review

CHESMAP Age Composition By Age

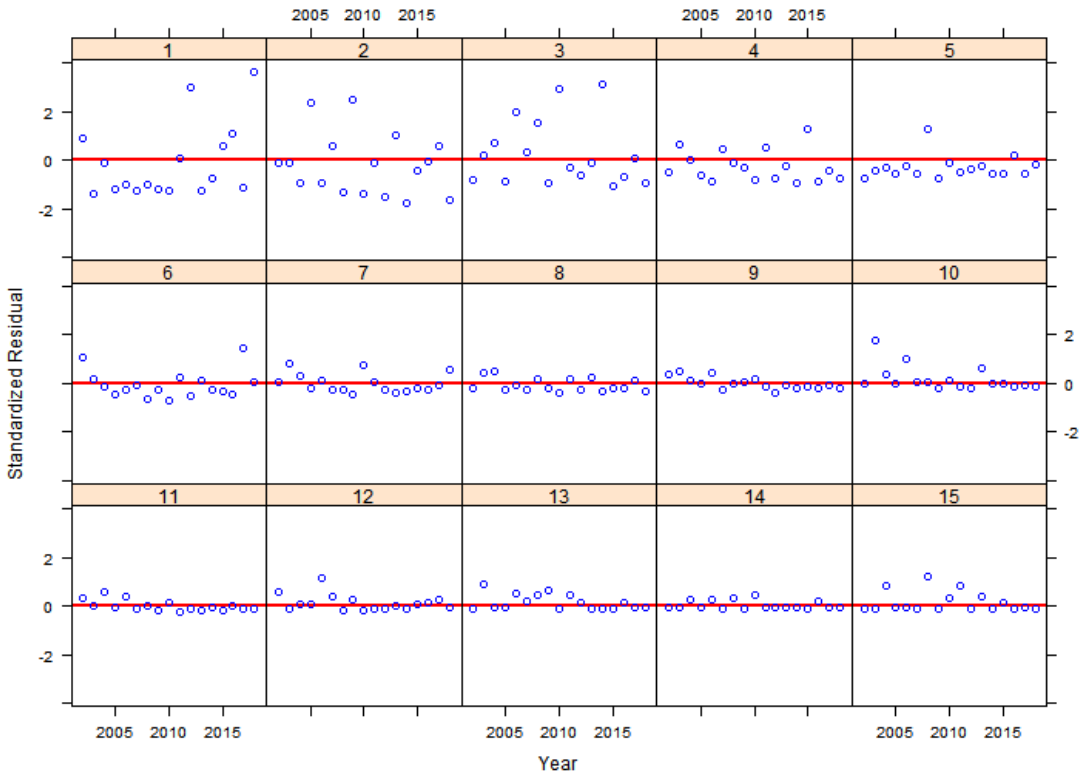


CHESMAP Age Composition By Year

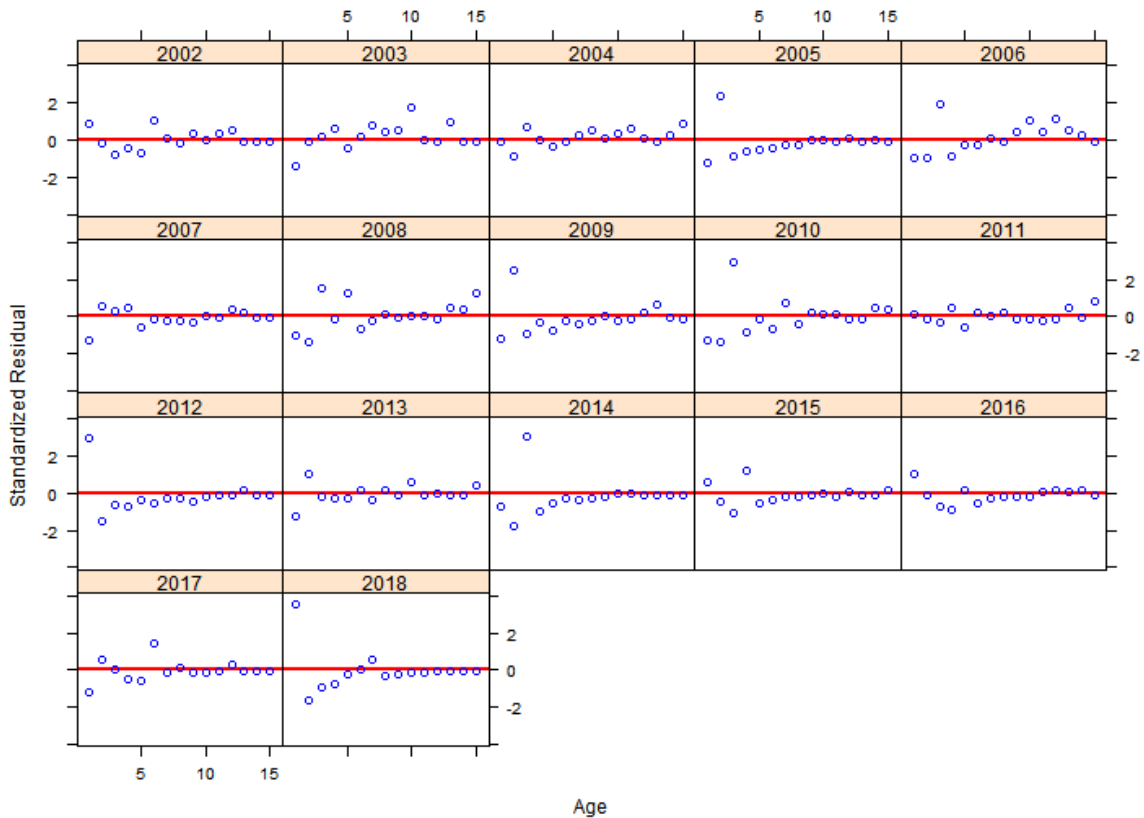


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CHESMAP Age Residuals By Age

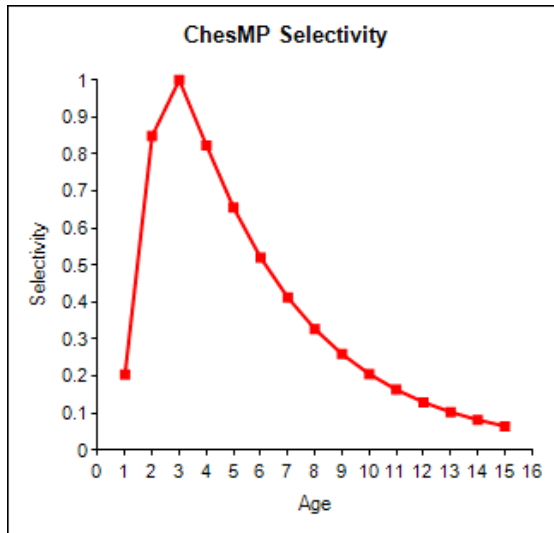
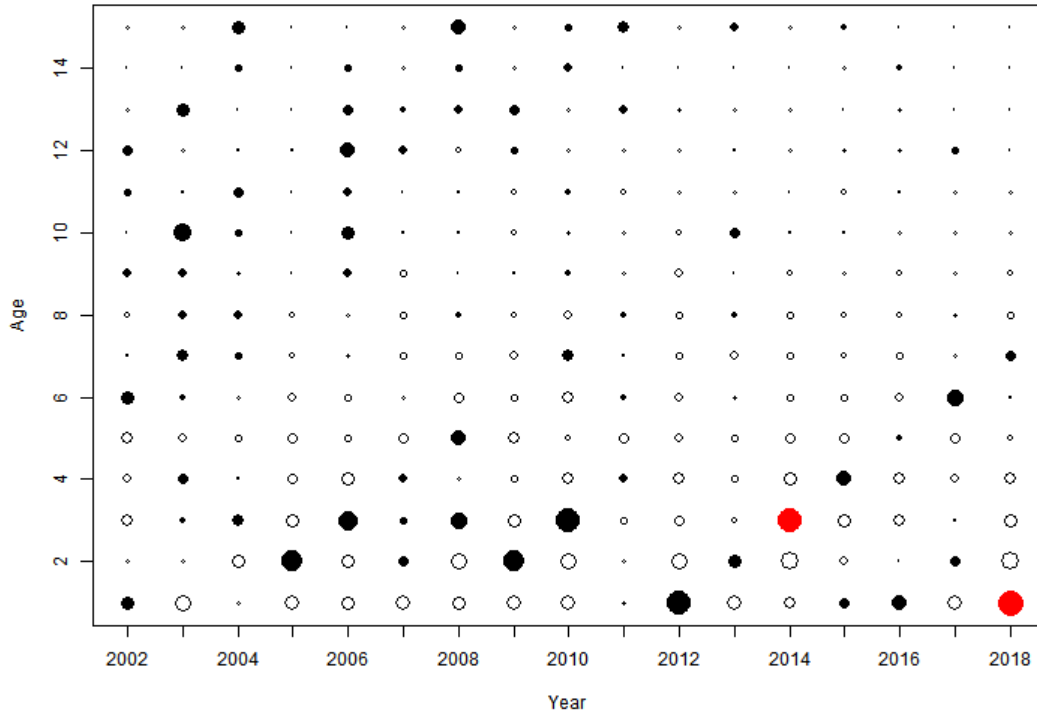


CHESMAP Age Residuals By Year



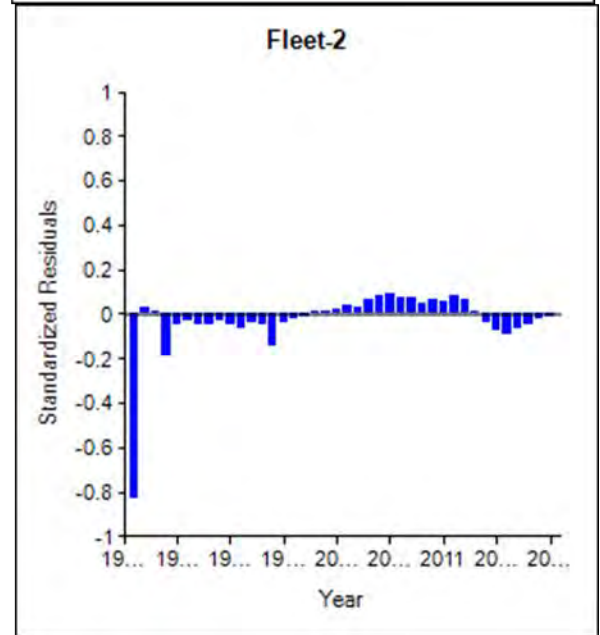
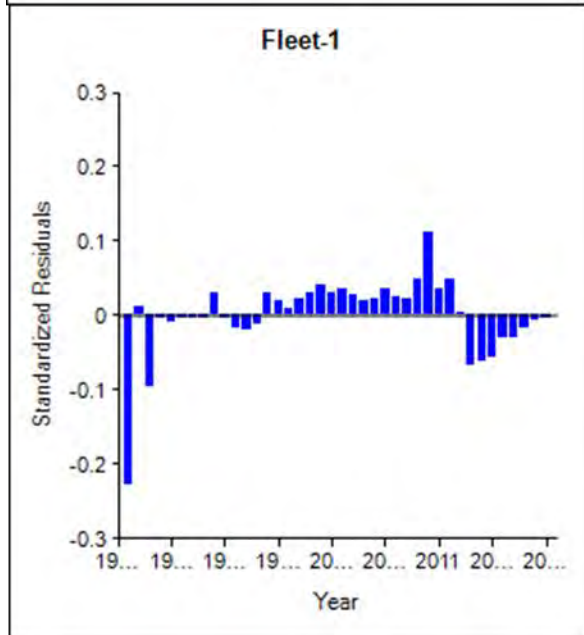
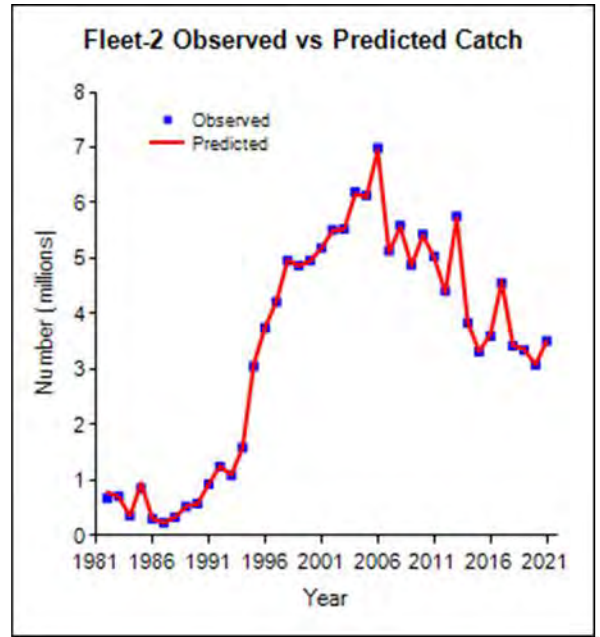
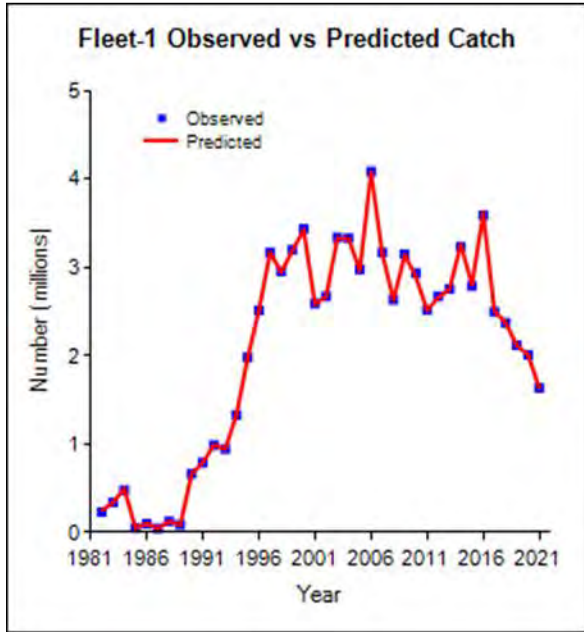
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CHESMAP Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)



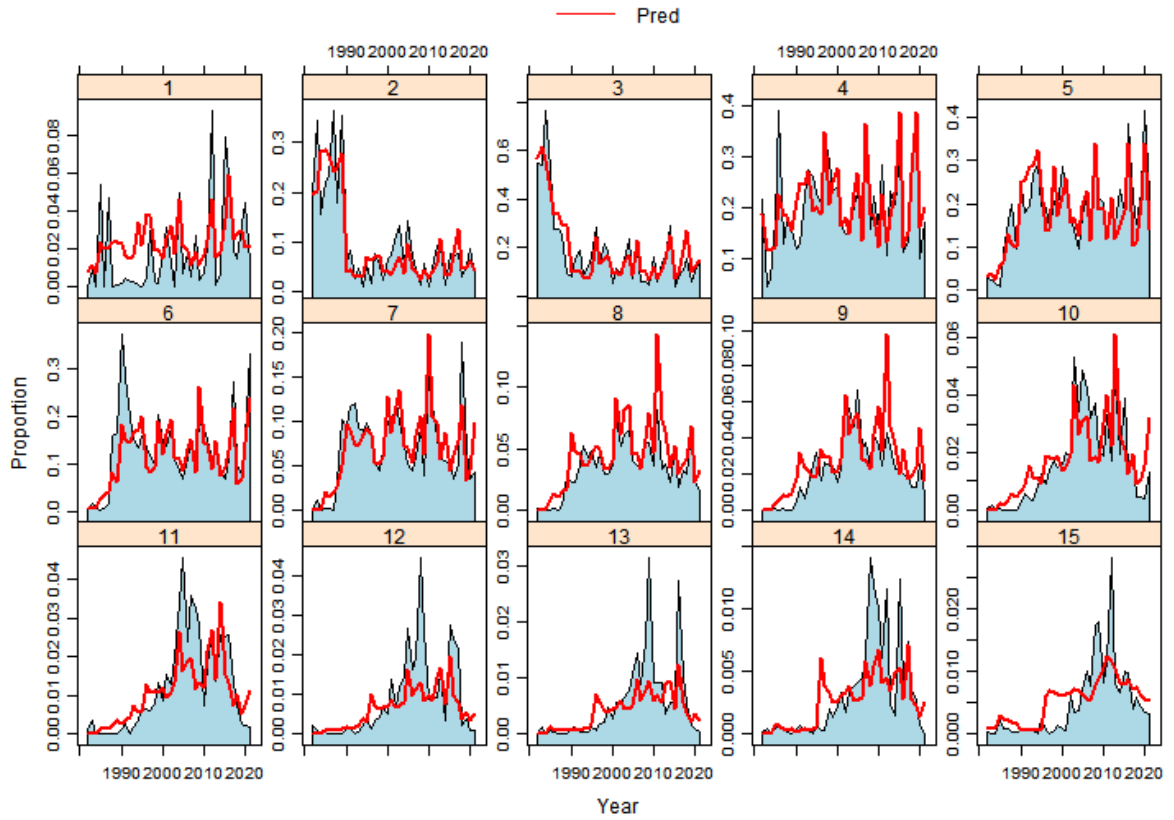
Appendix 3. Diagnostic plots and results for a model run in which a new 2020-2021 selectivity block was added for the Ocean region only.

Draft for Board Review

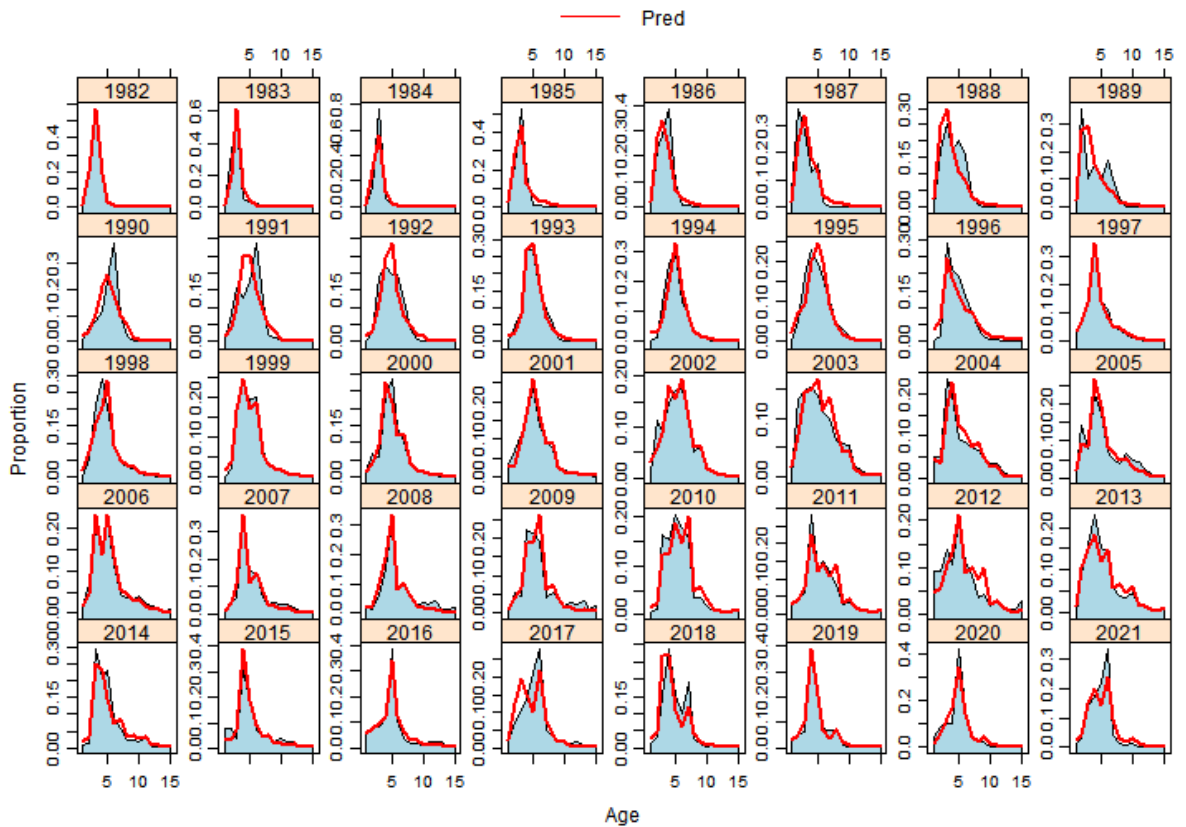


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Fleet 1 Catch Age Composition By Age

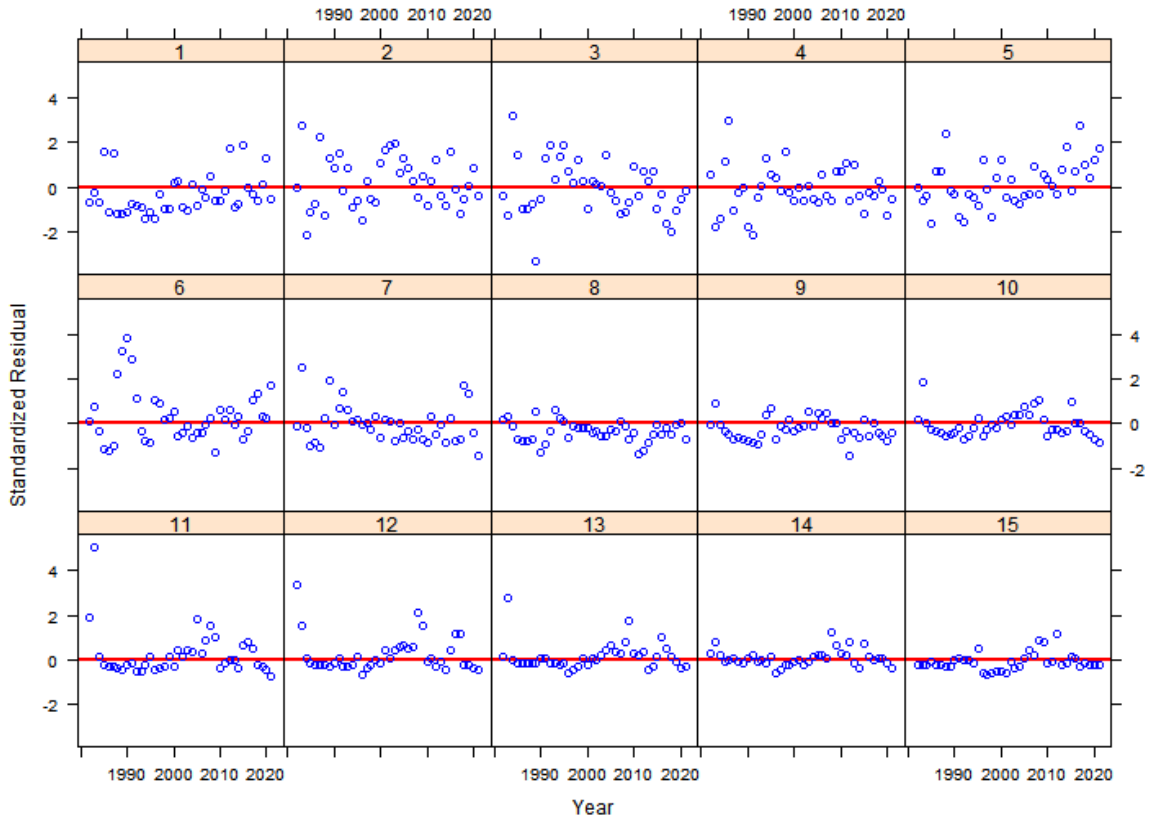


Fleet 1 Catch Age Composition By Year

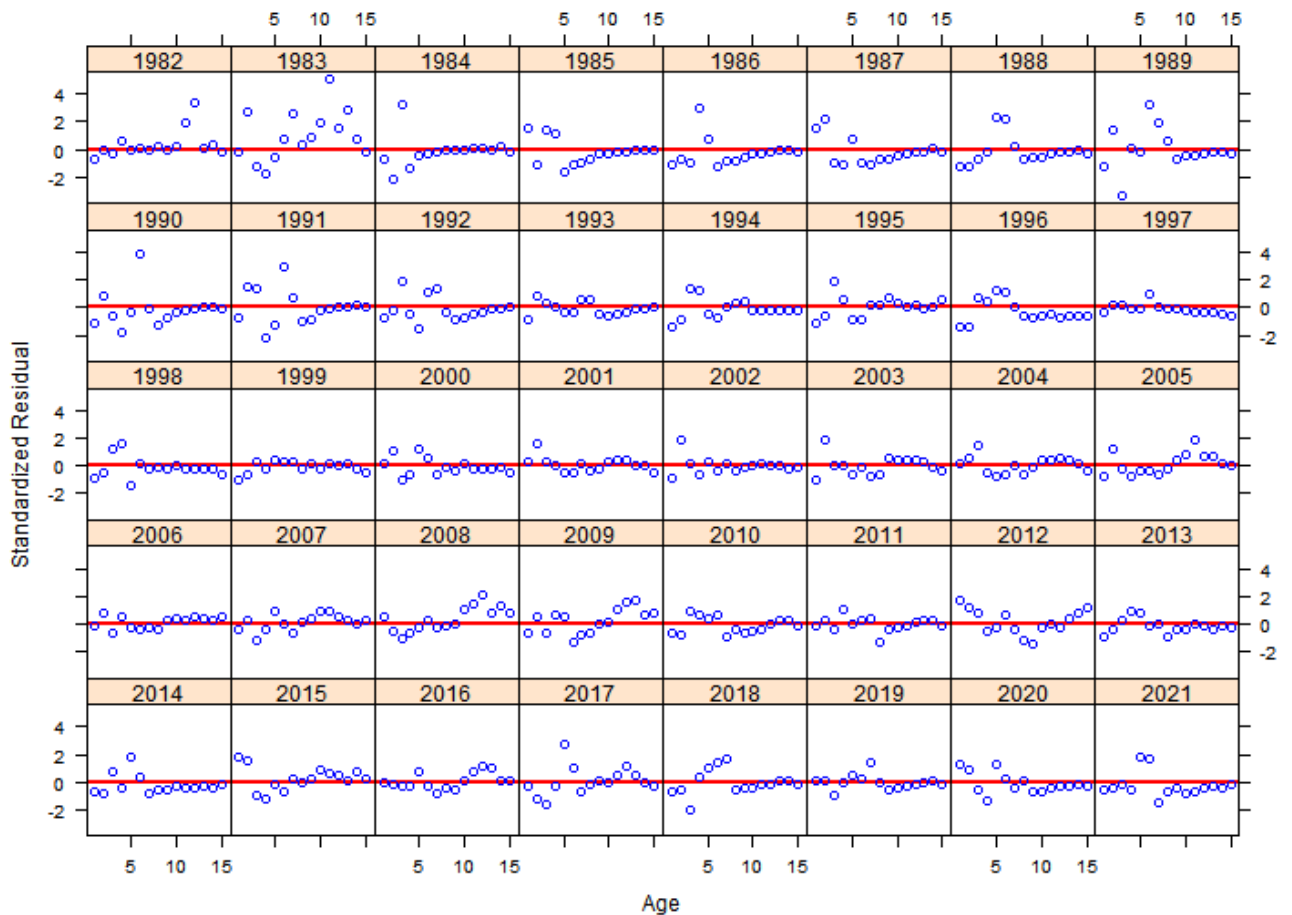


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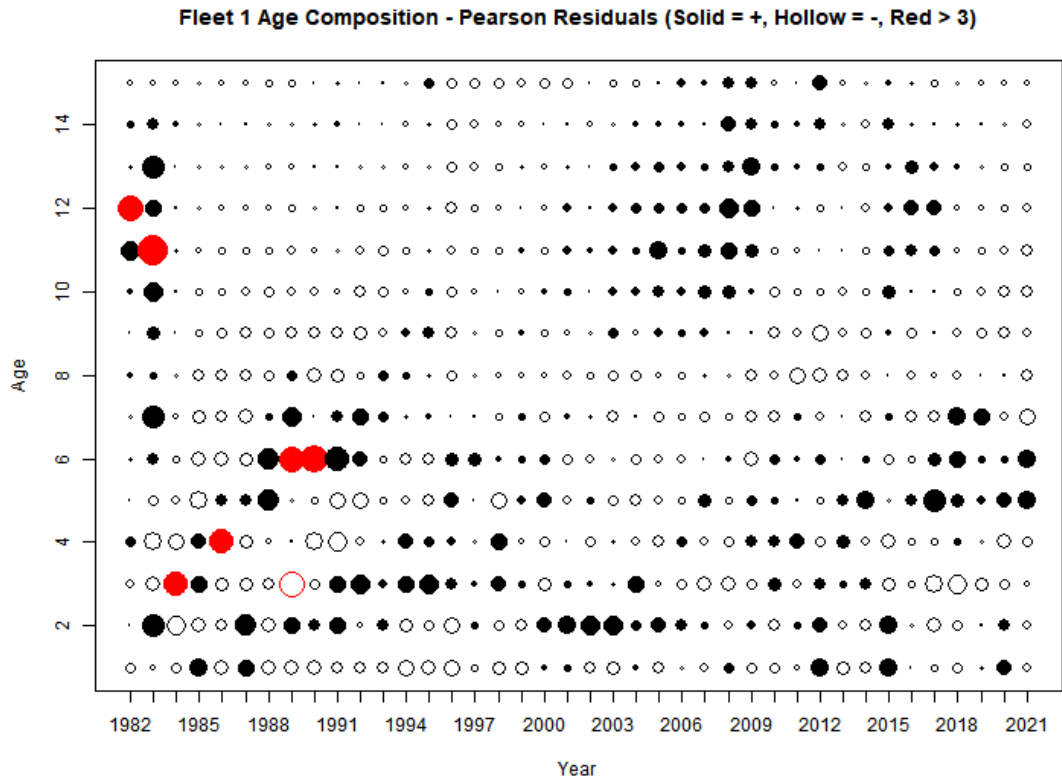
Fleet 1 Residuals of Age Composition By Age



Fleet 1 Residuals of Age Composition By Year

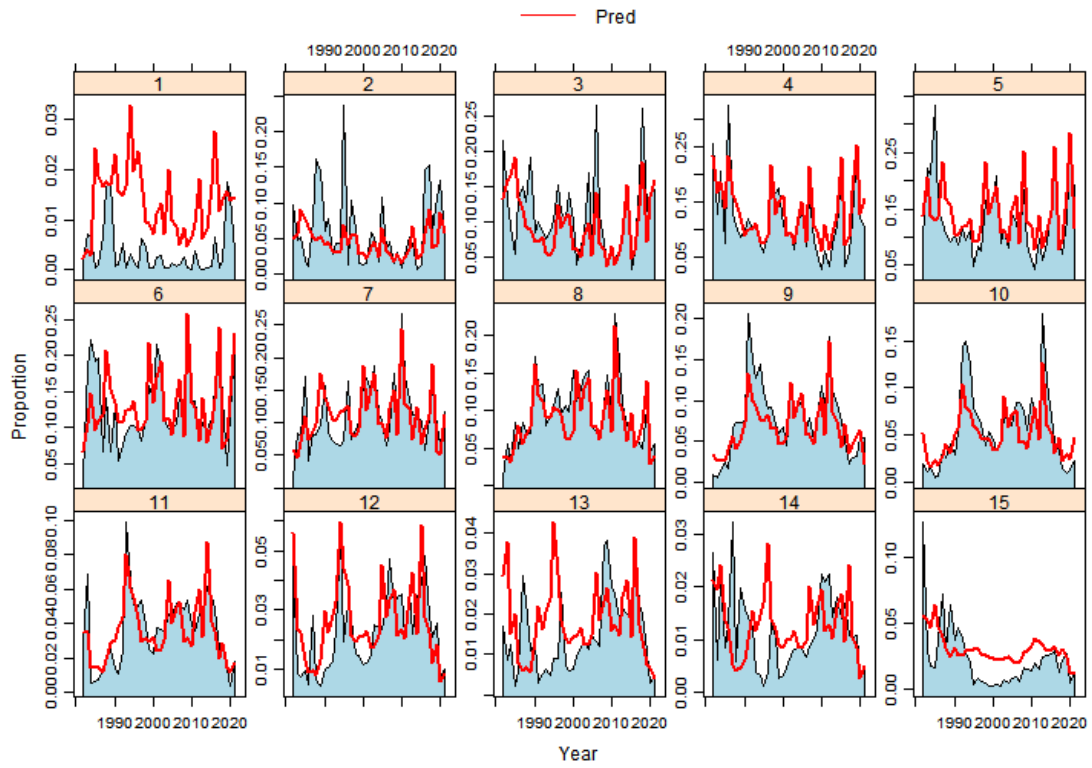


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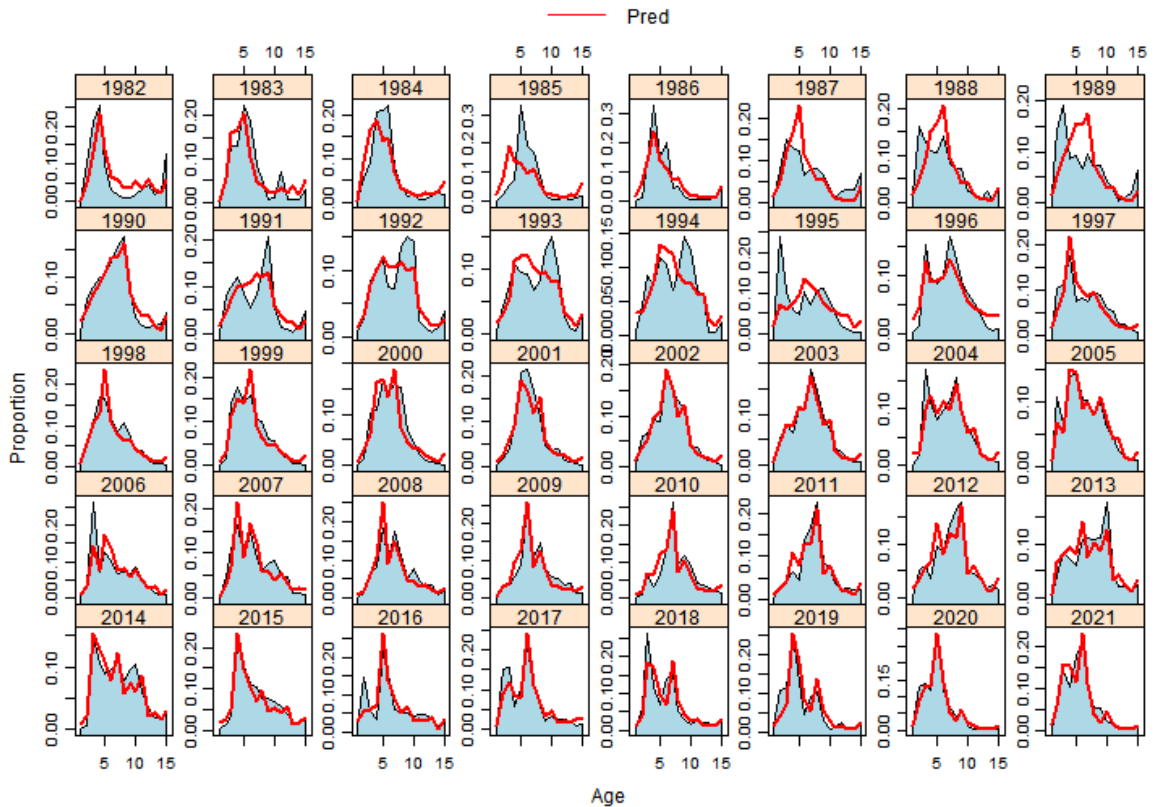


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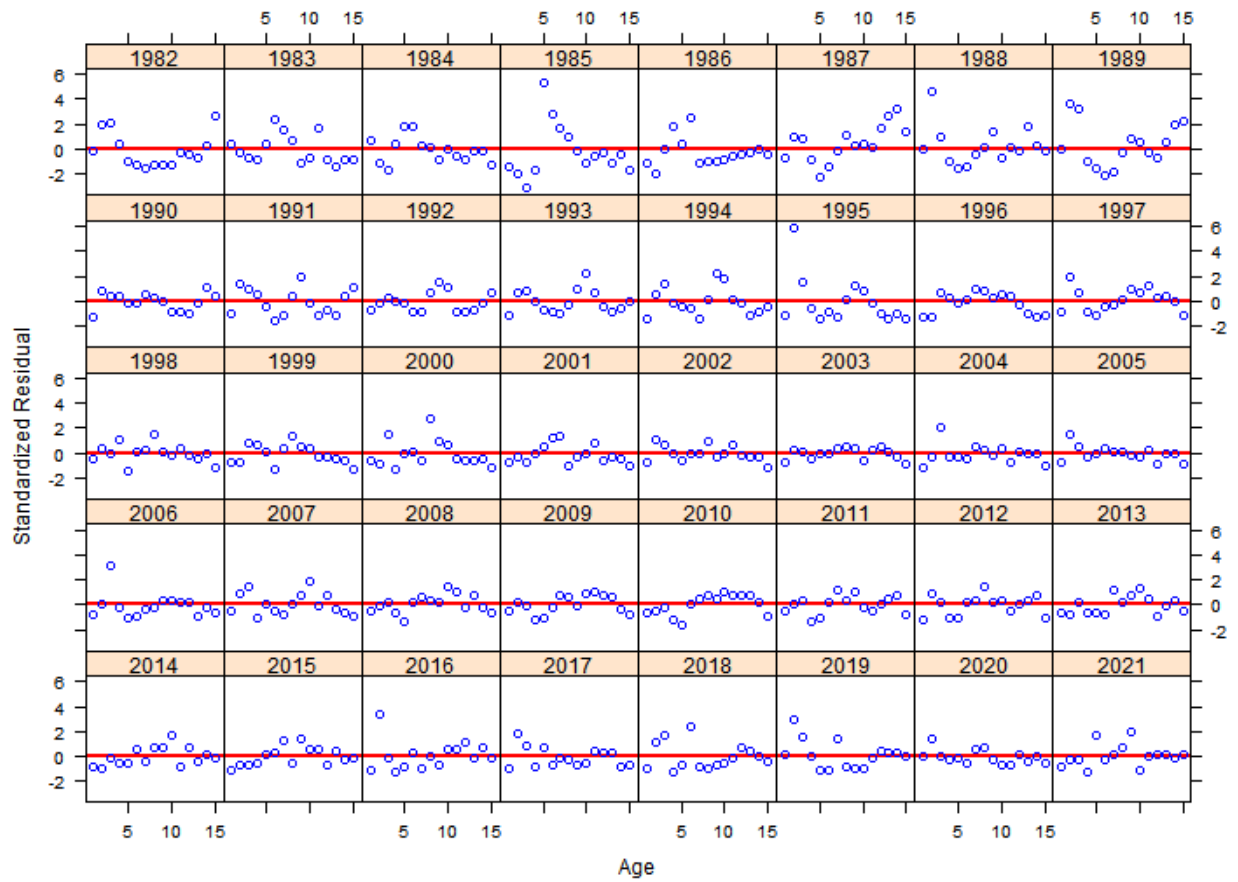


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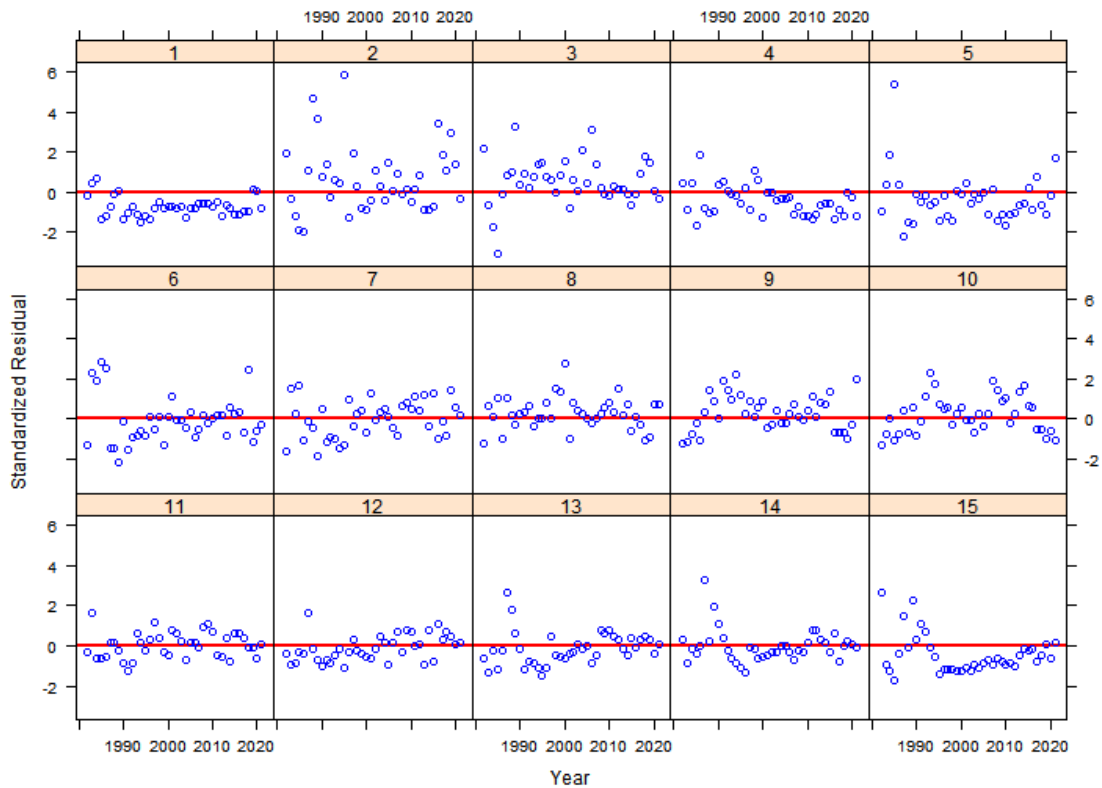


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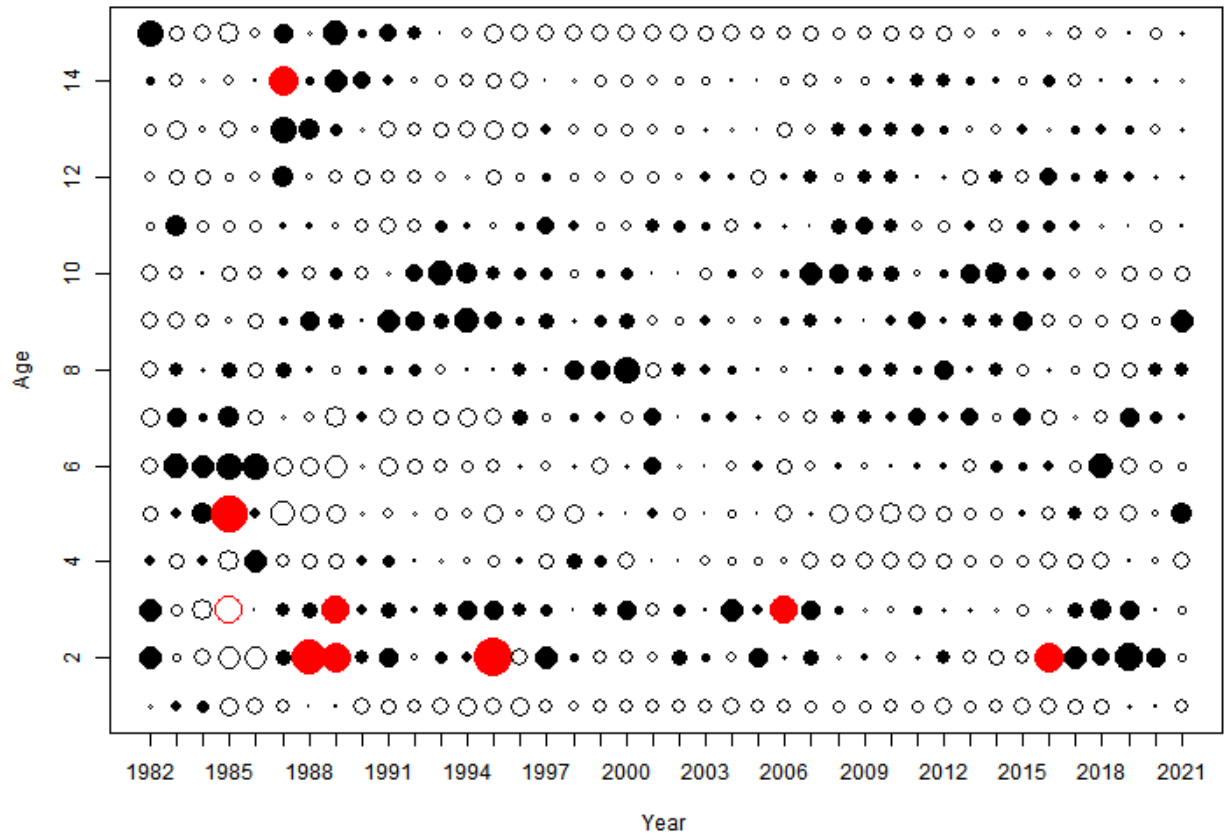


Fleet 2 Residuals of Age Composition By Age

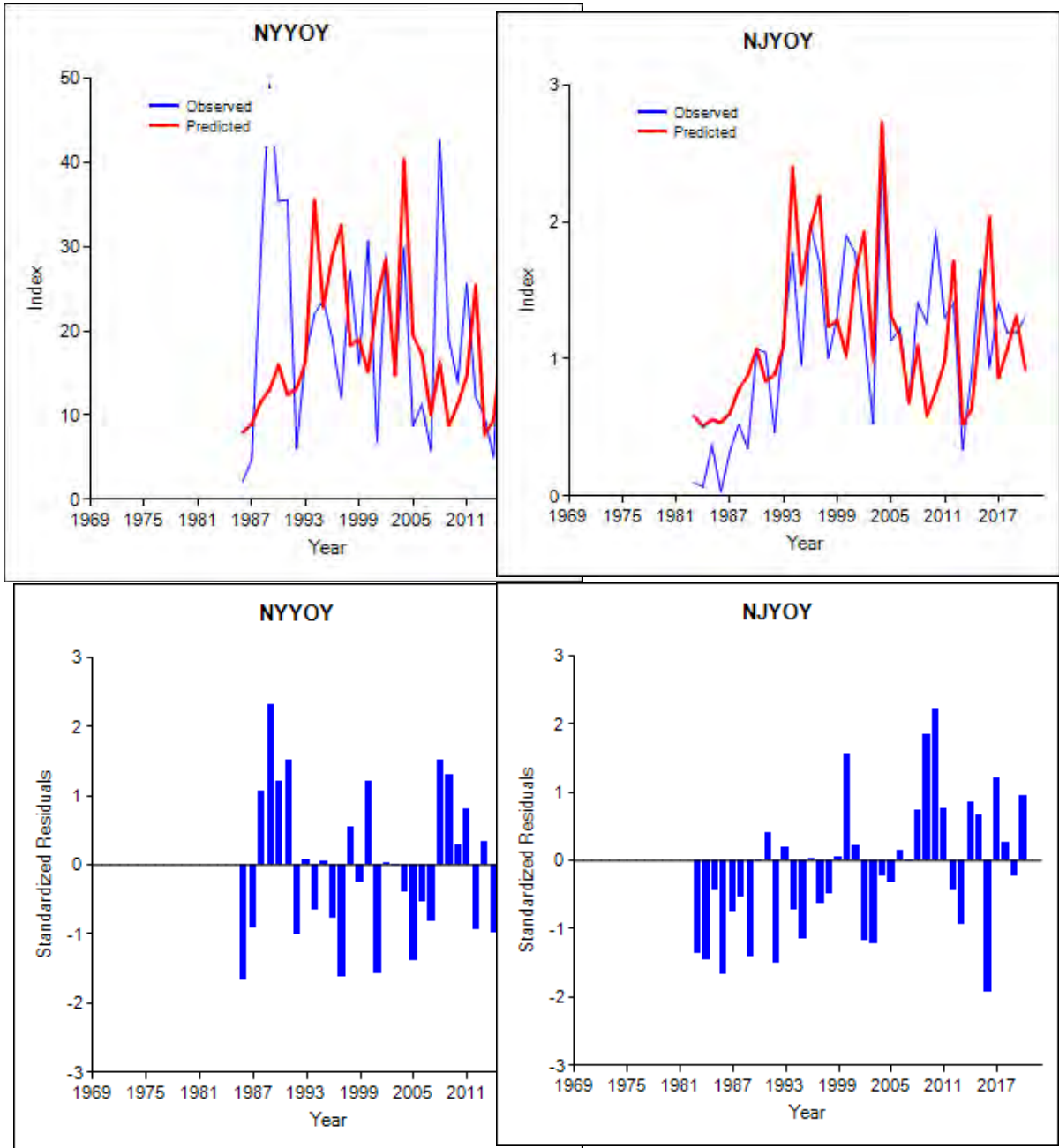


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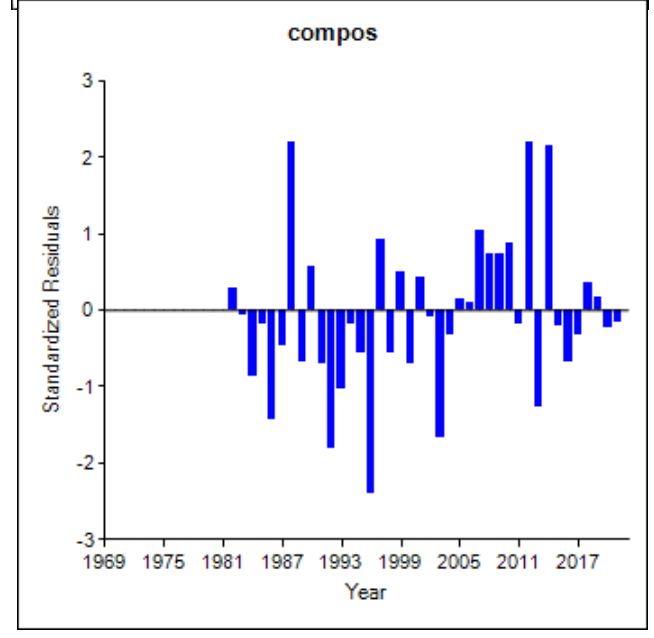
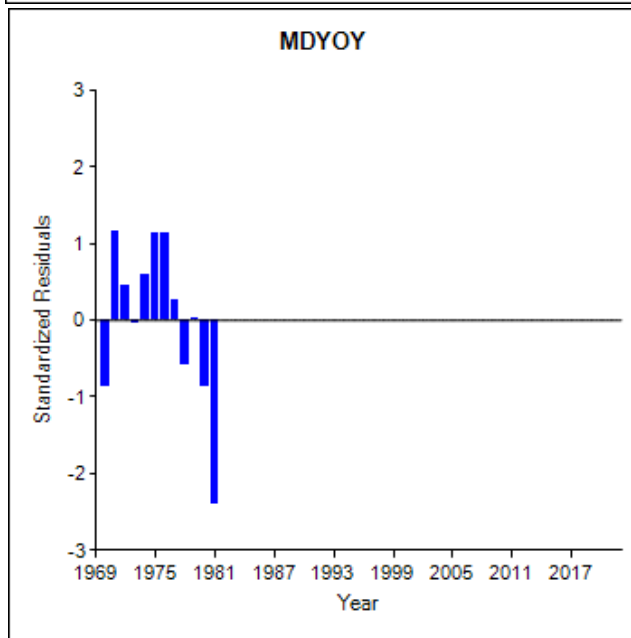
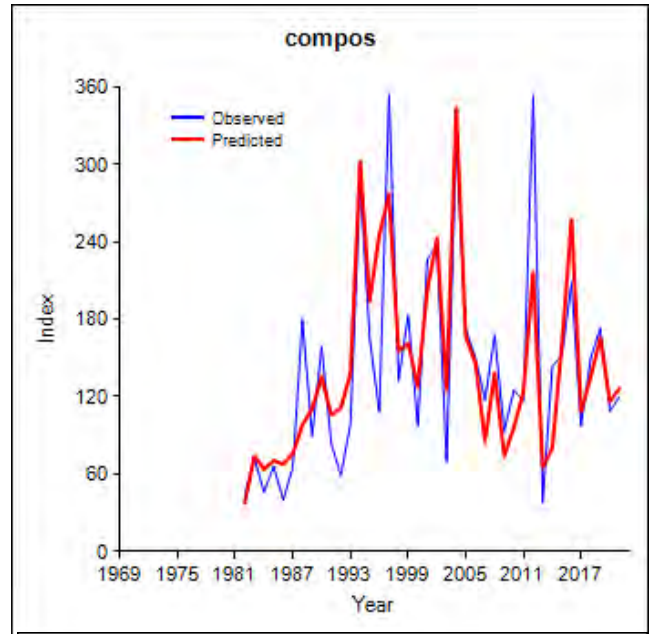
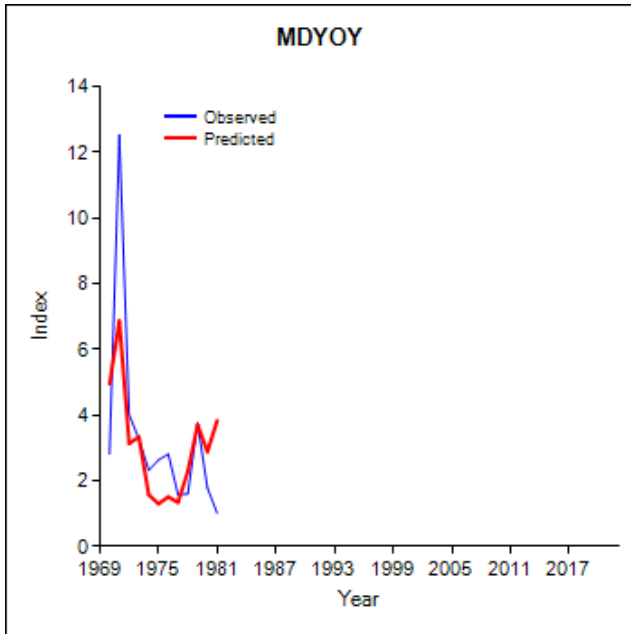
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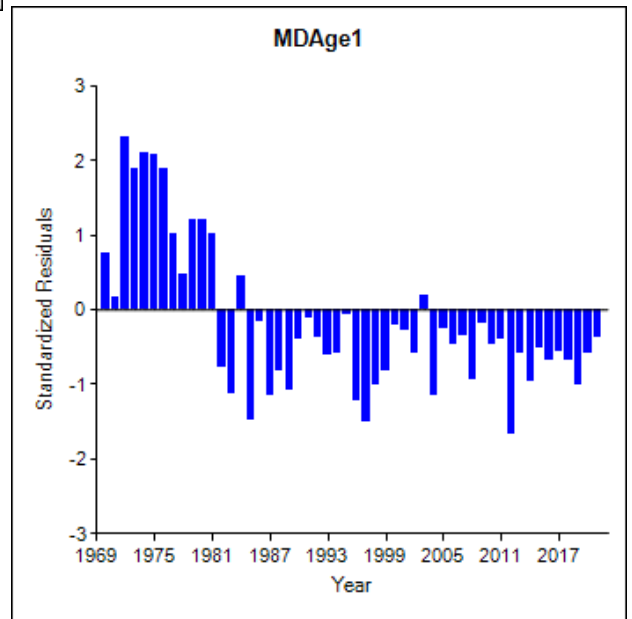
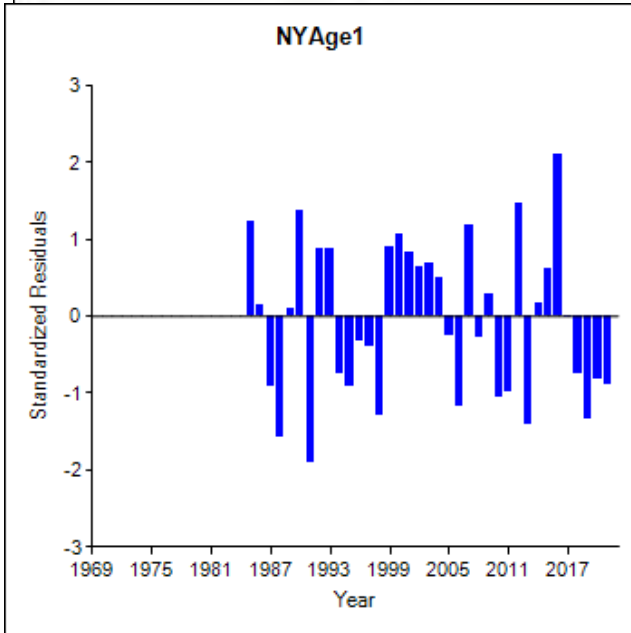
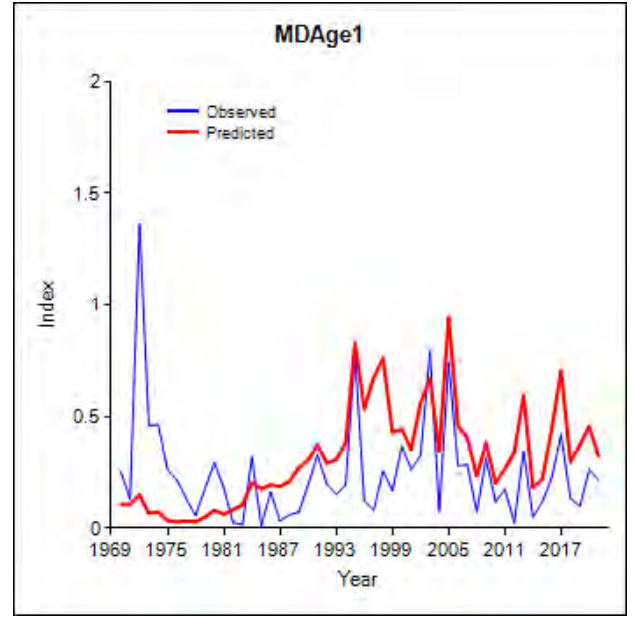
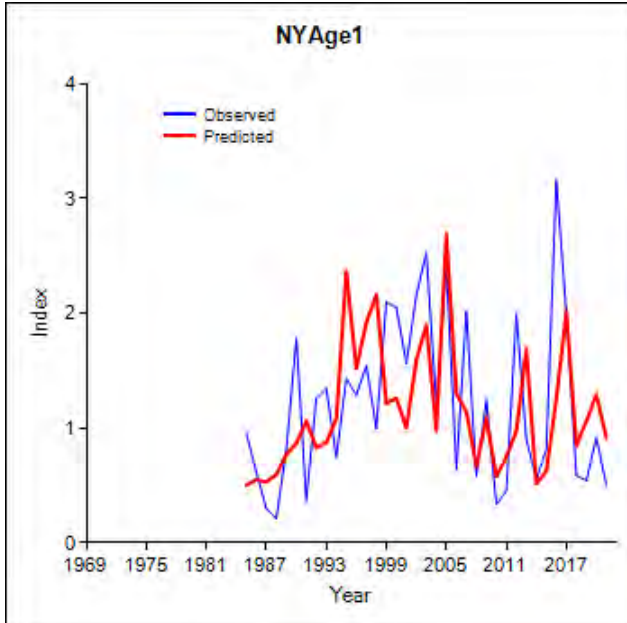
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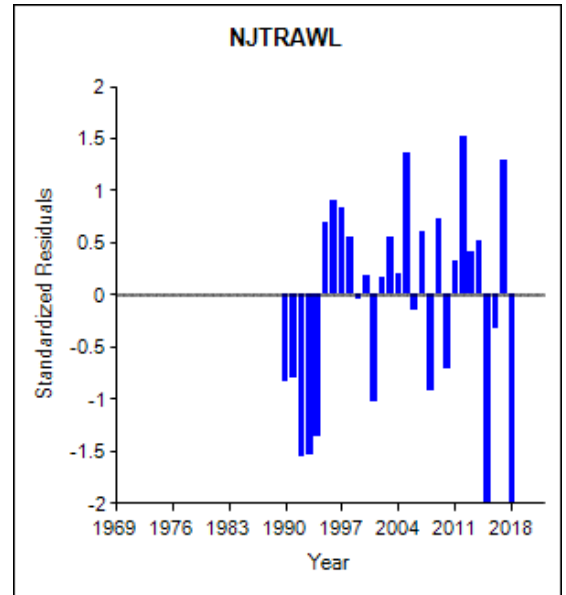
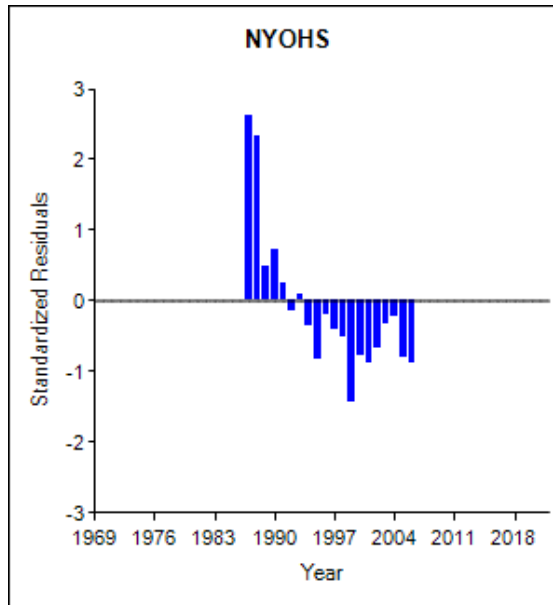
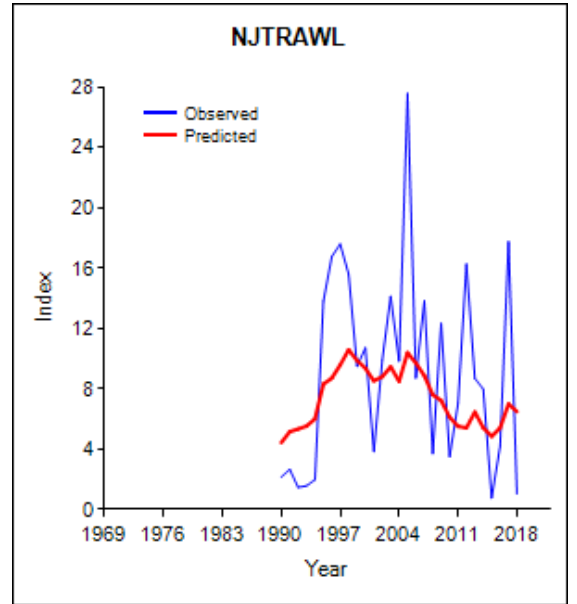
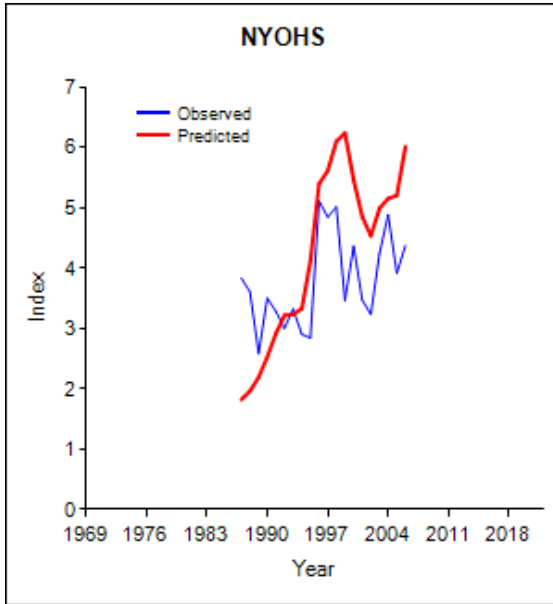
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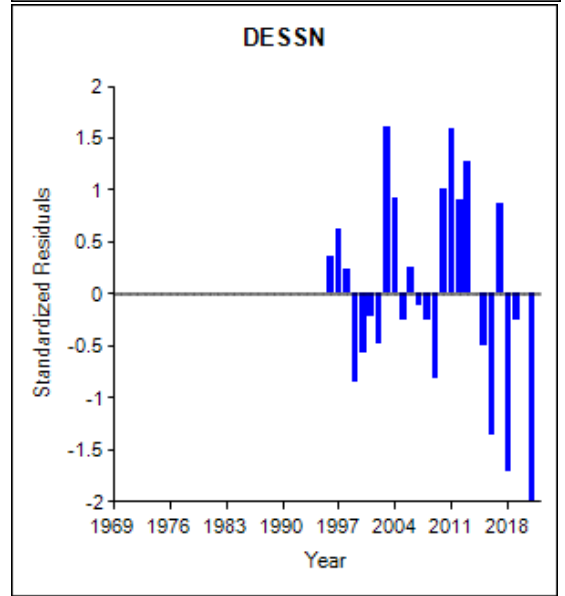
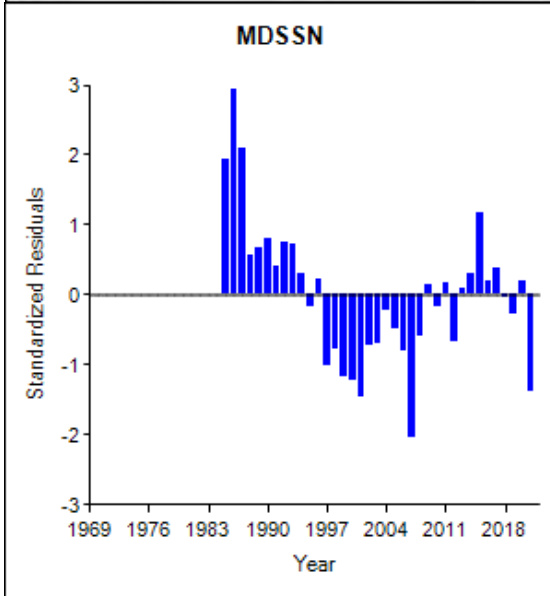
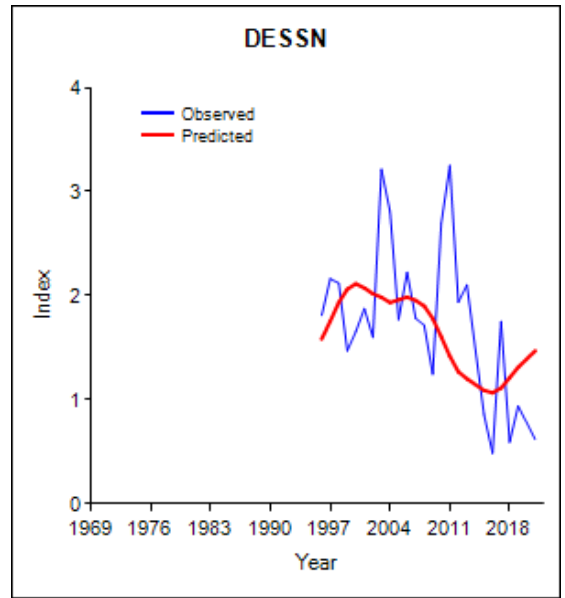
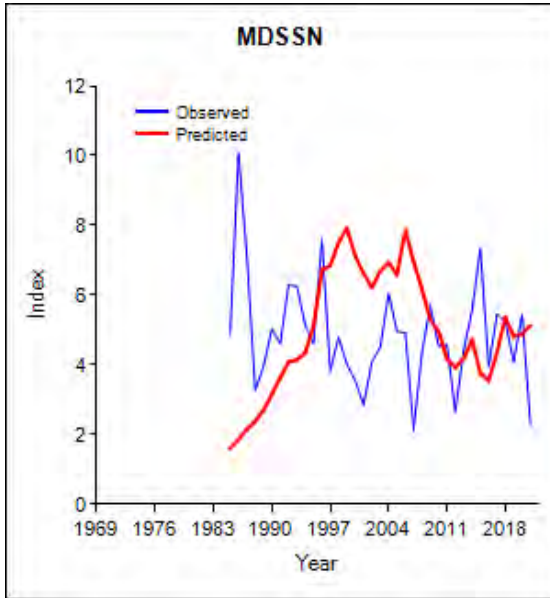
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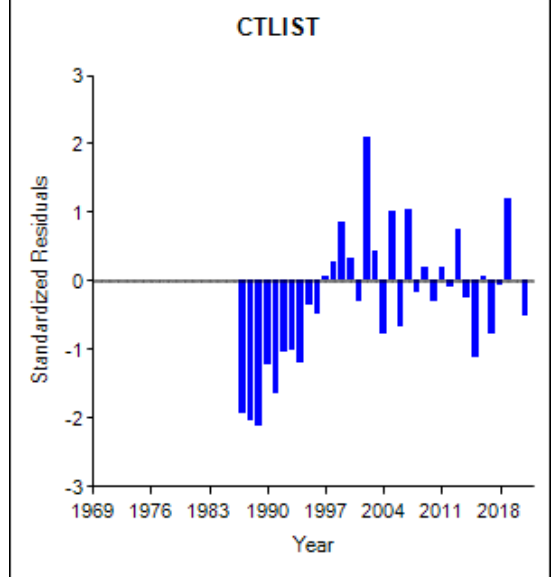
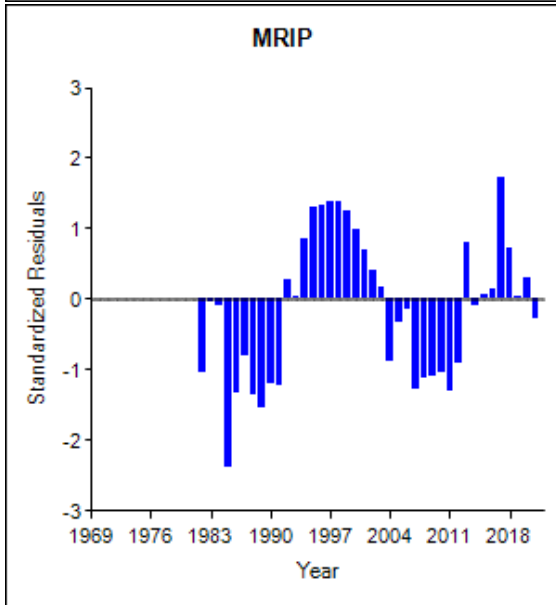
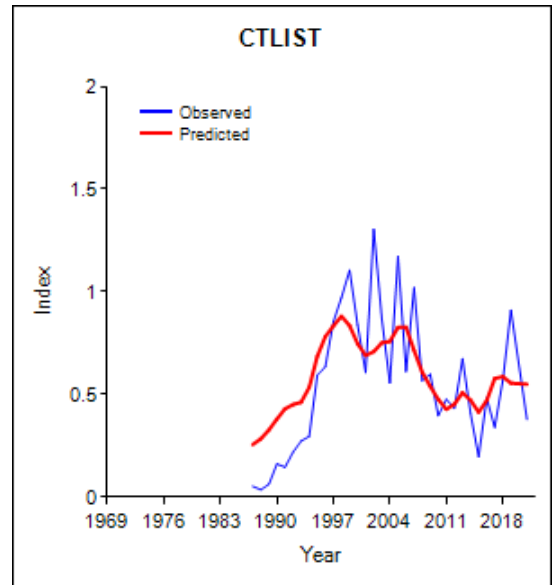
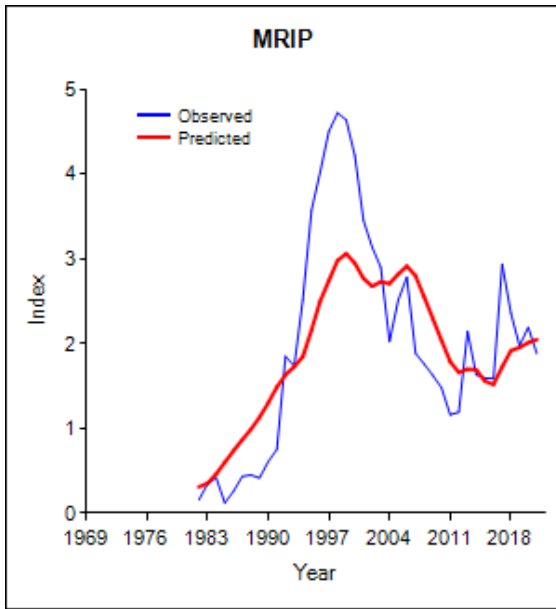
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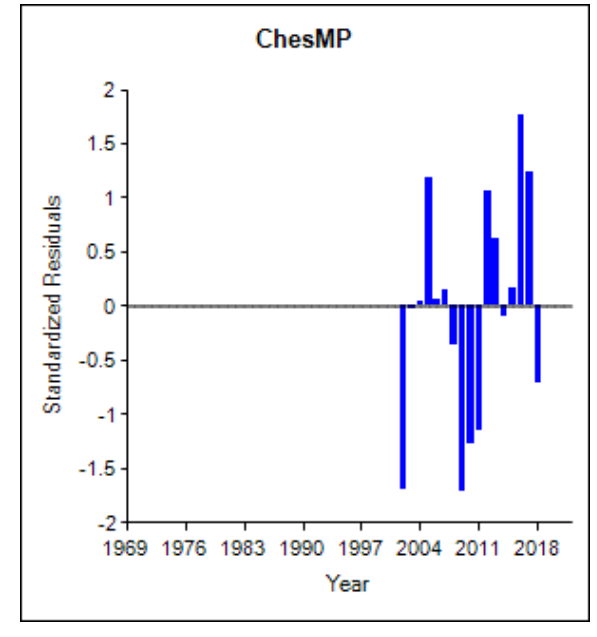
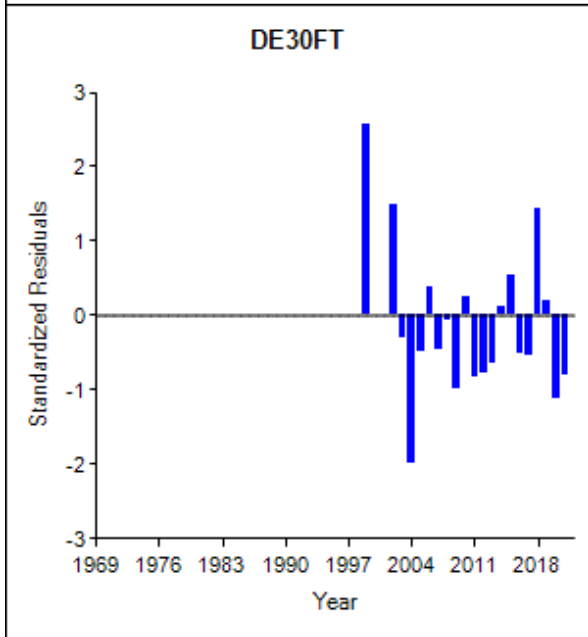
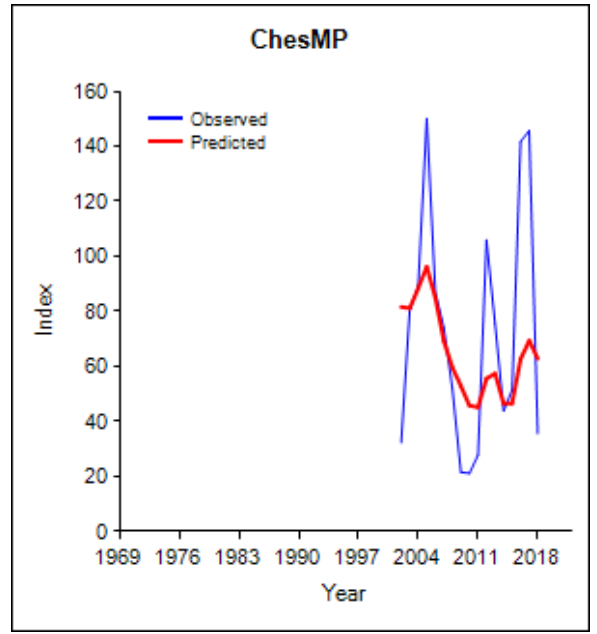
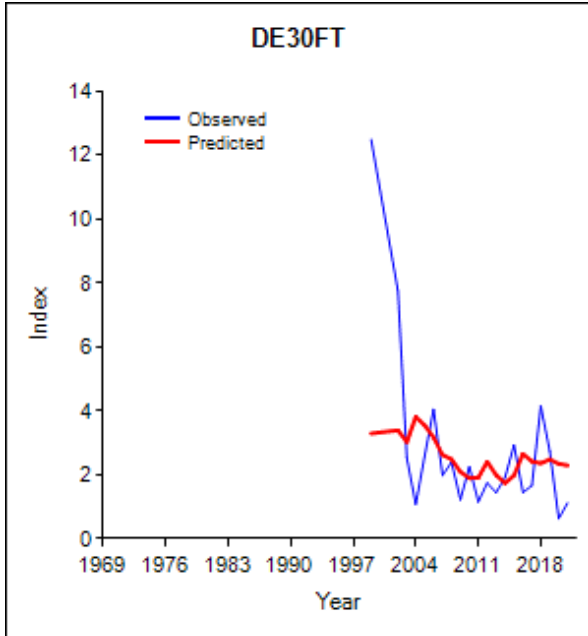
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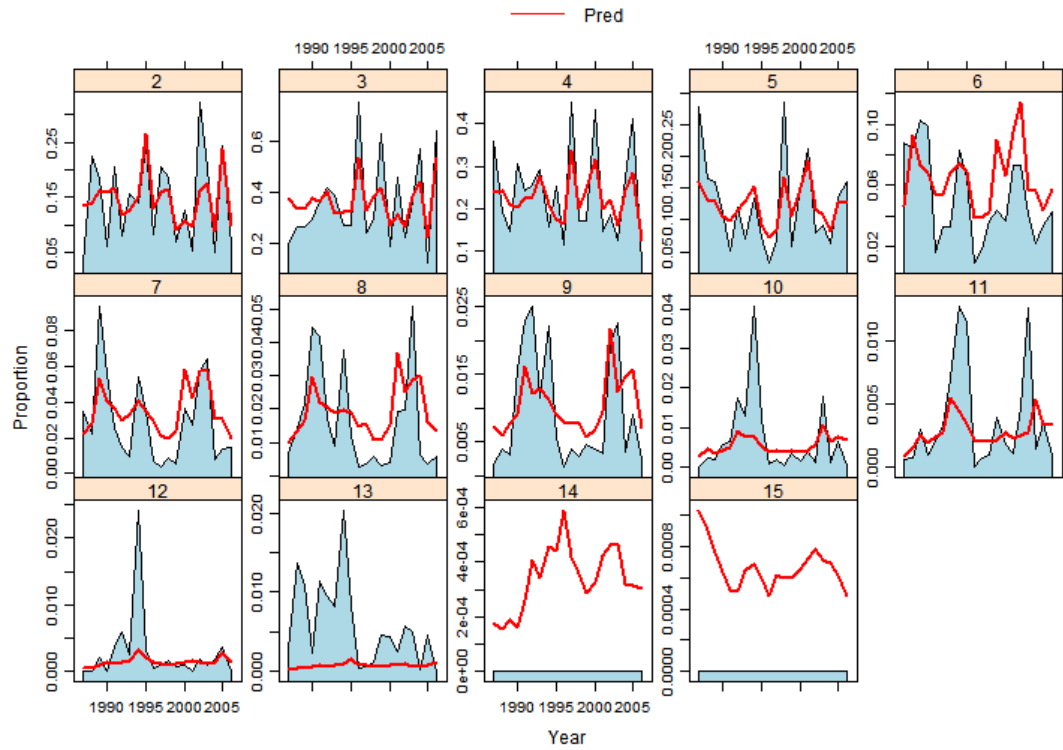


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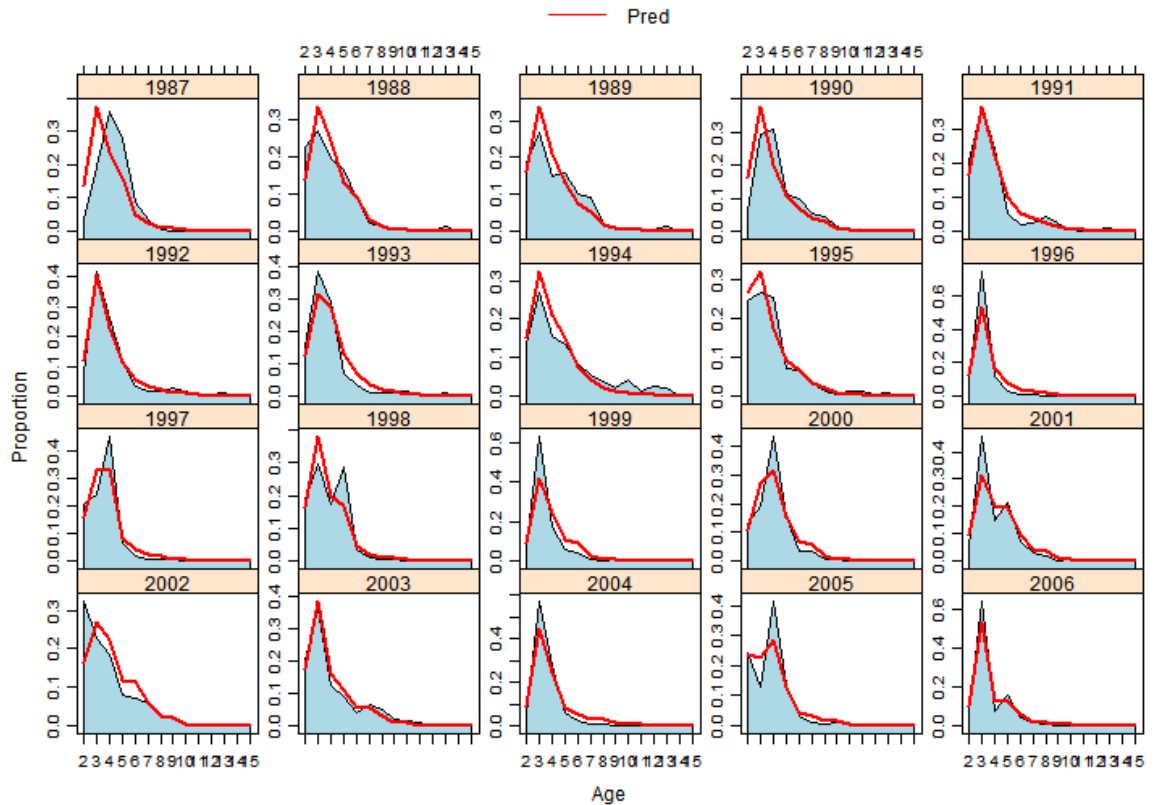


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NYOHS Age Composition By Age

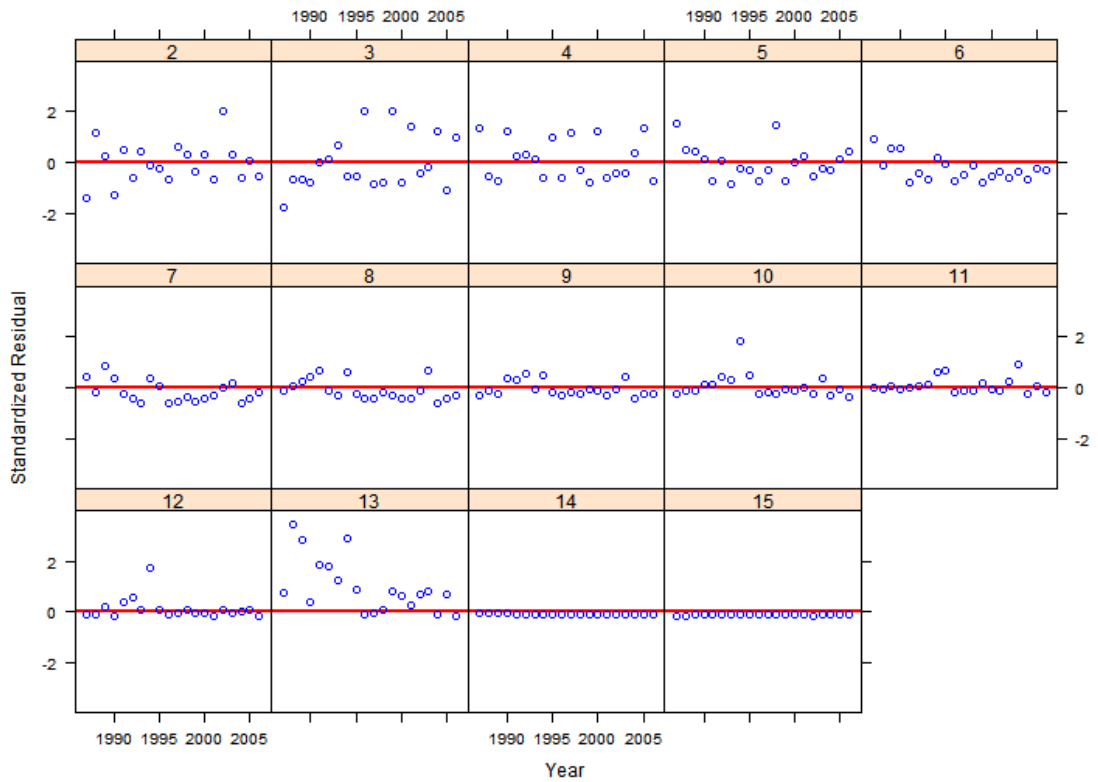


NYOHS Age Composition By Year

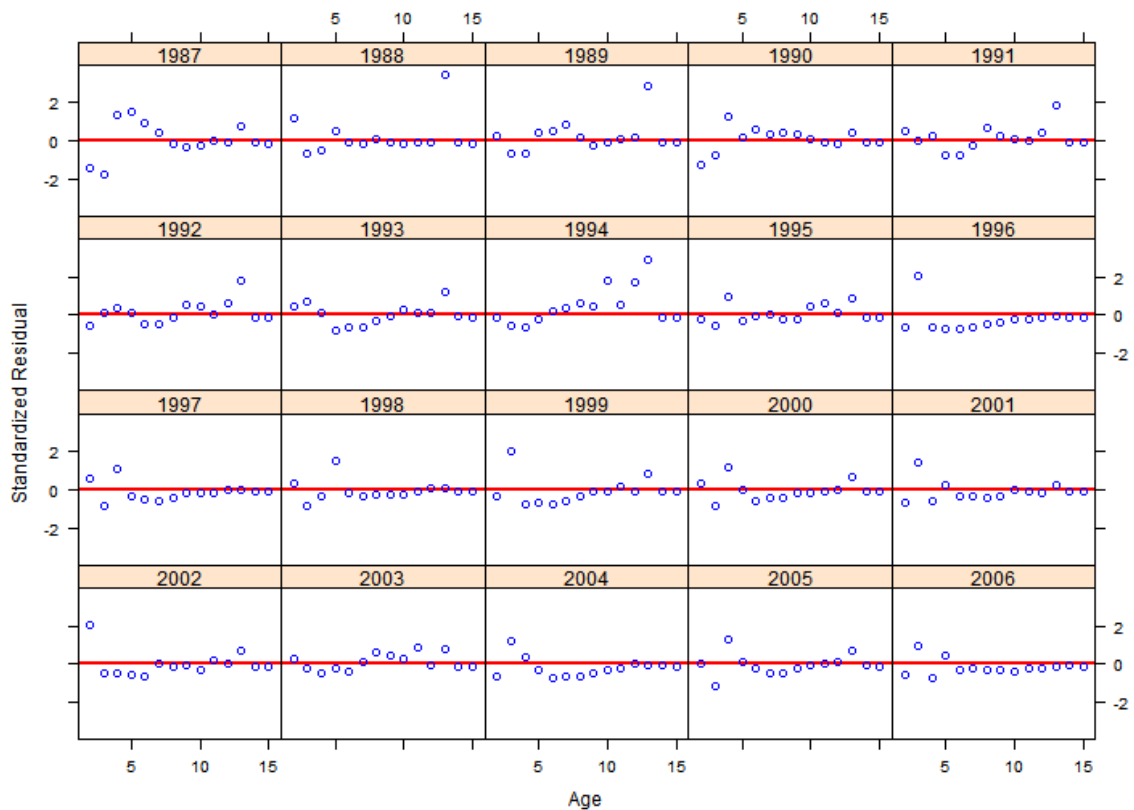


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NYOHS Age Residuals By Age

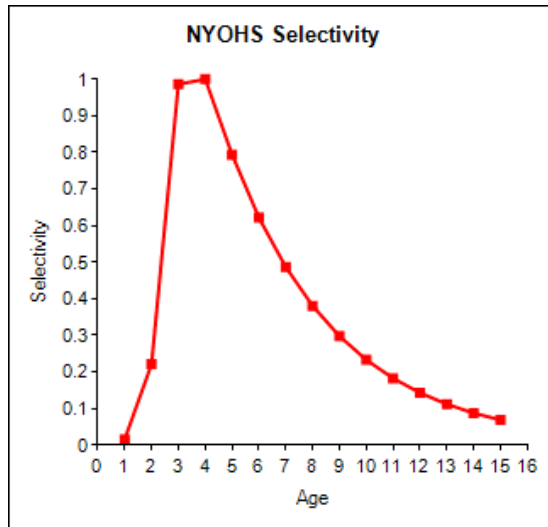
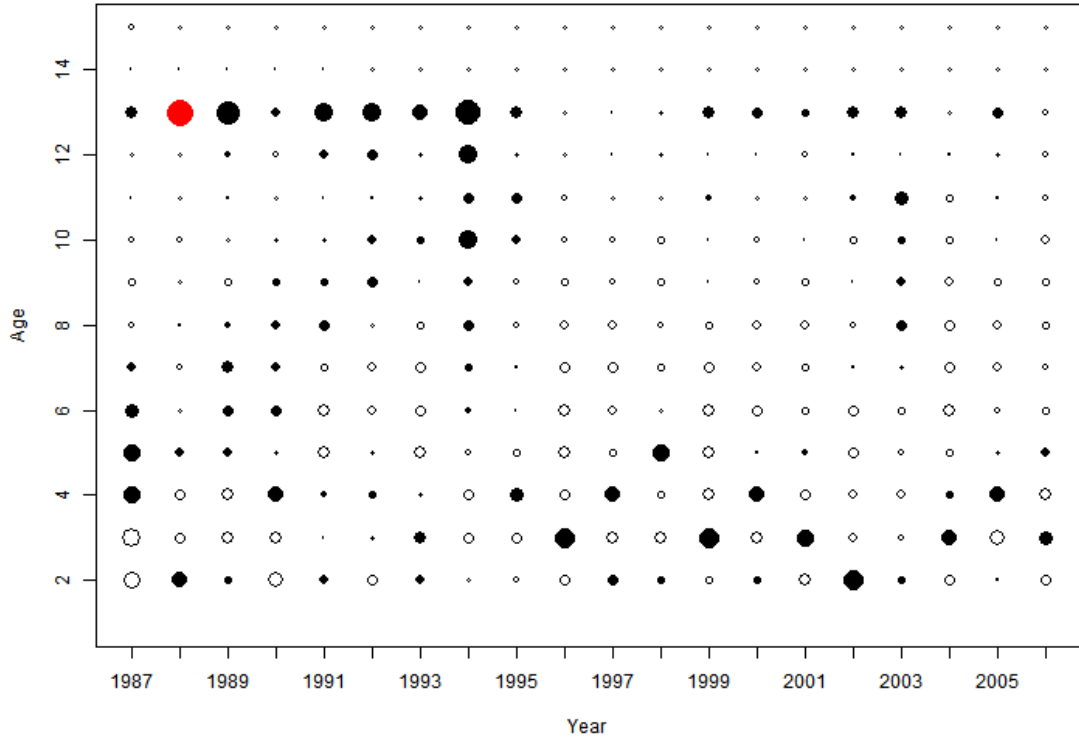


NYOHS Age Residuals By Year



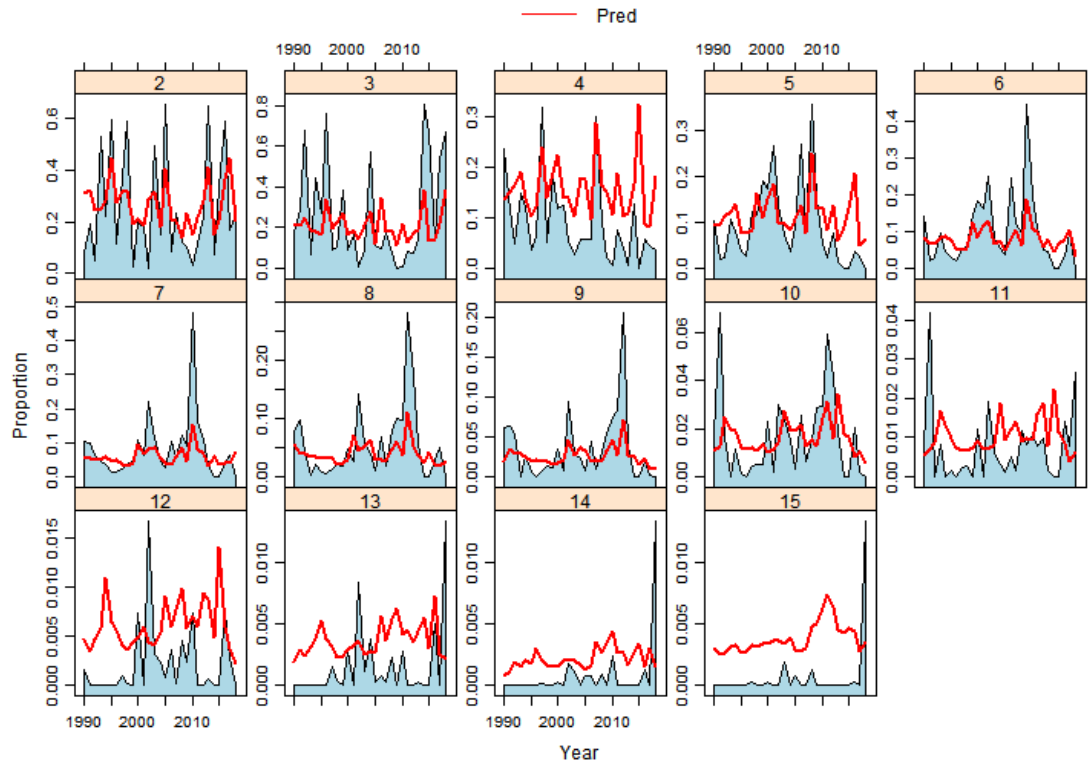
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NYOHS Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)

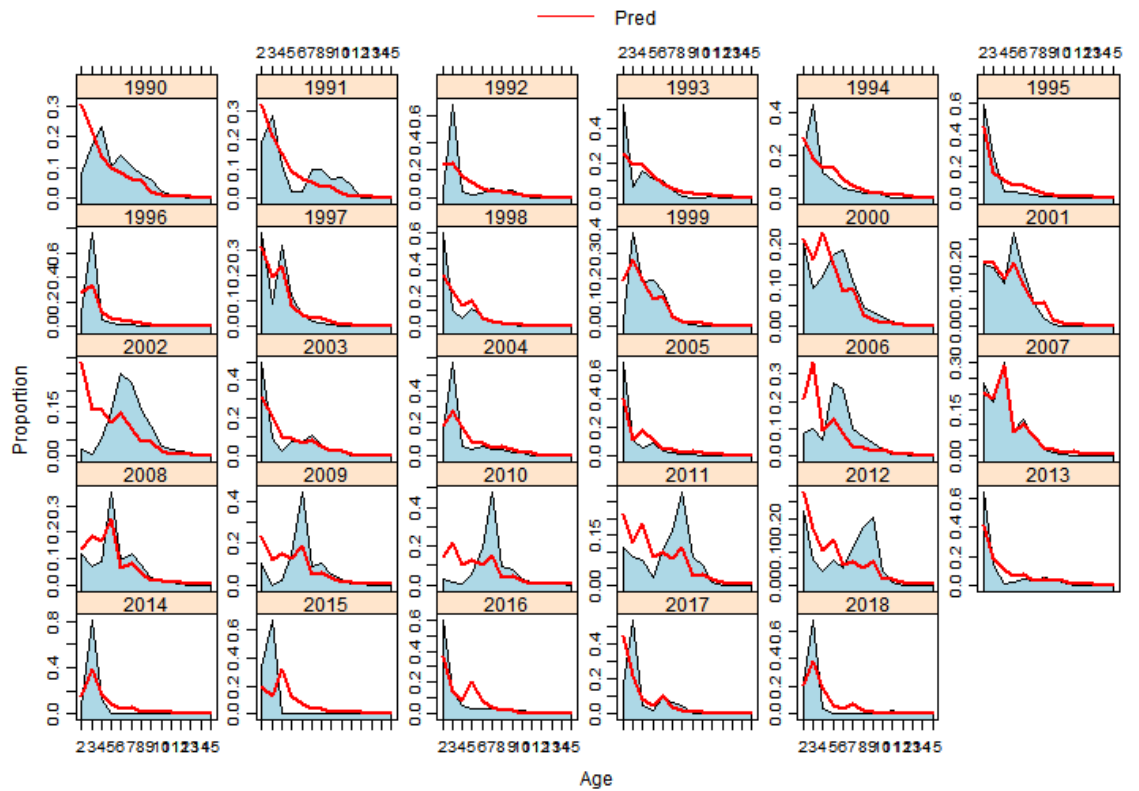


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NJTrawl Age Composition By Age

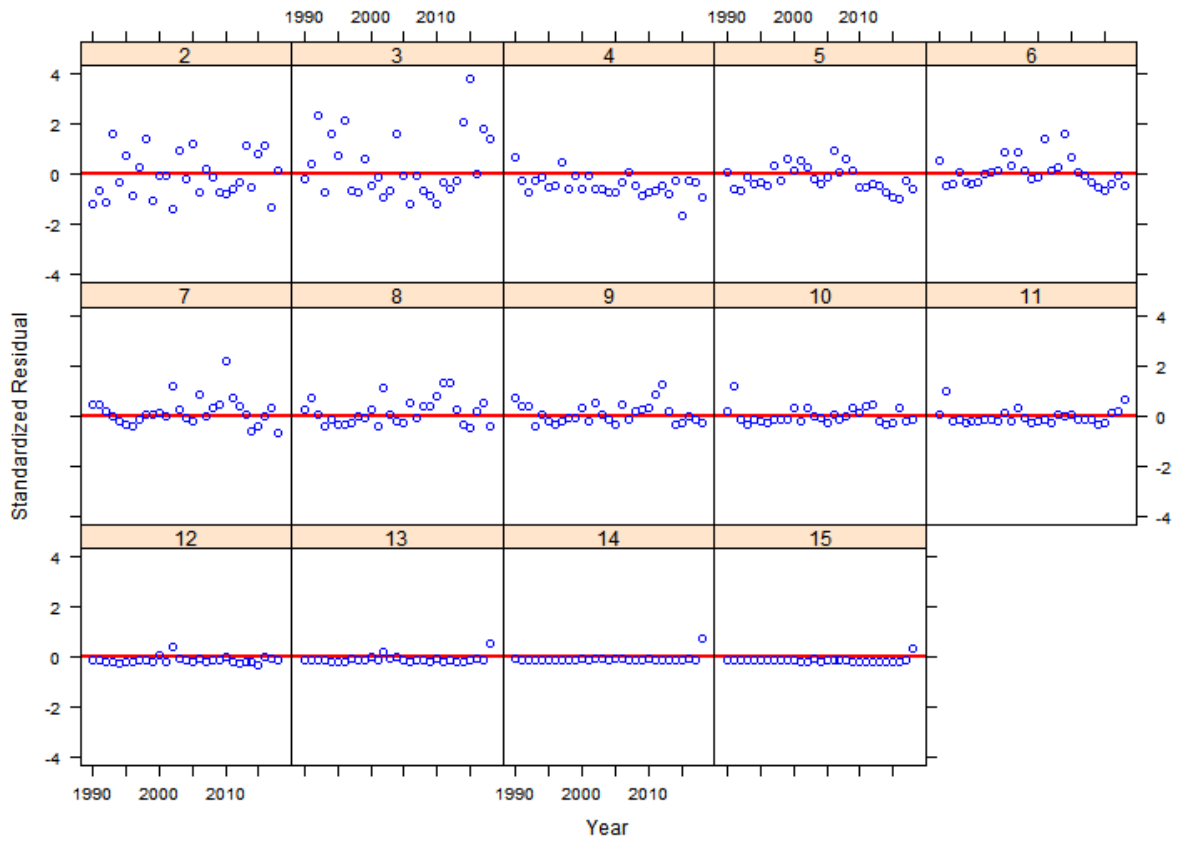


NJTrawl Age Composition By Year

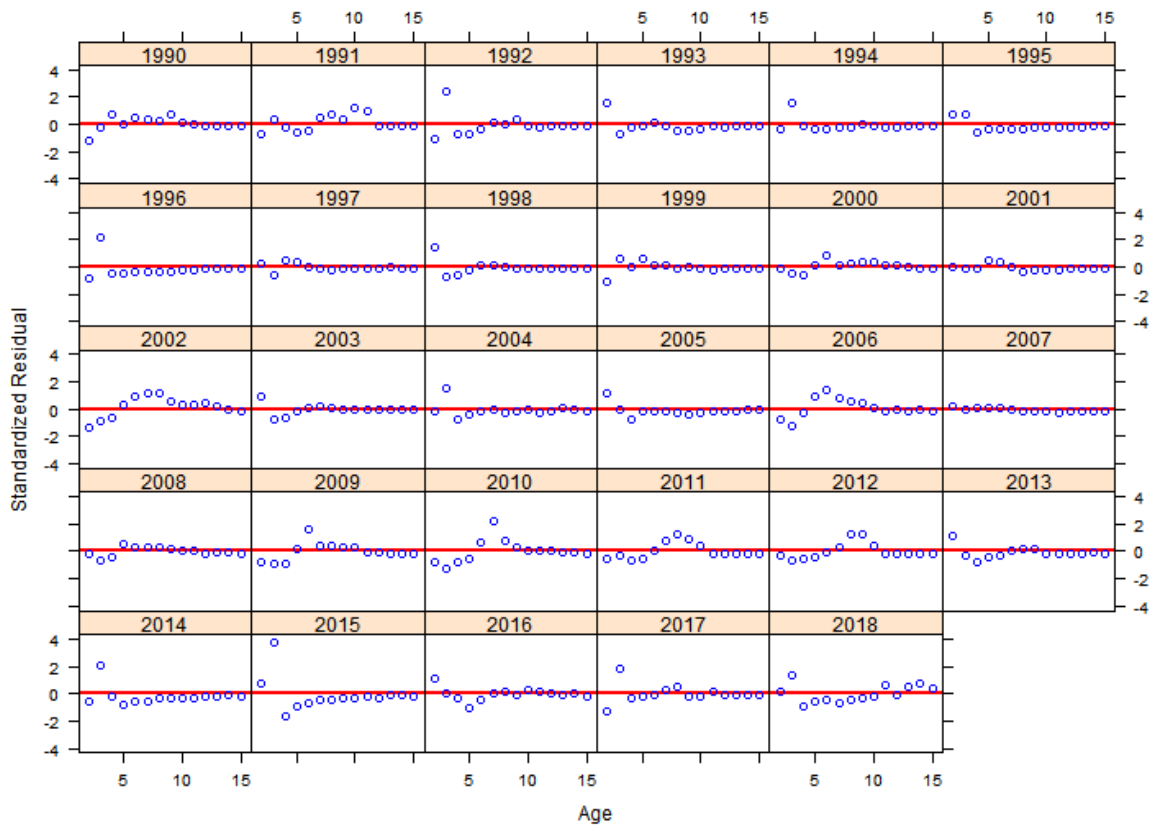


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NJTrawl Age Residuals By Age

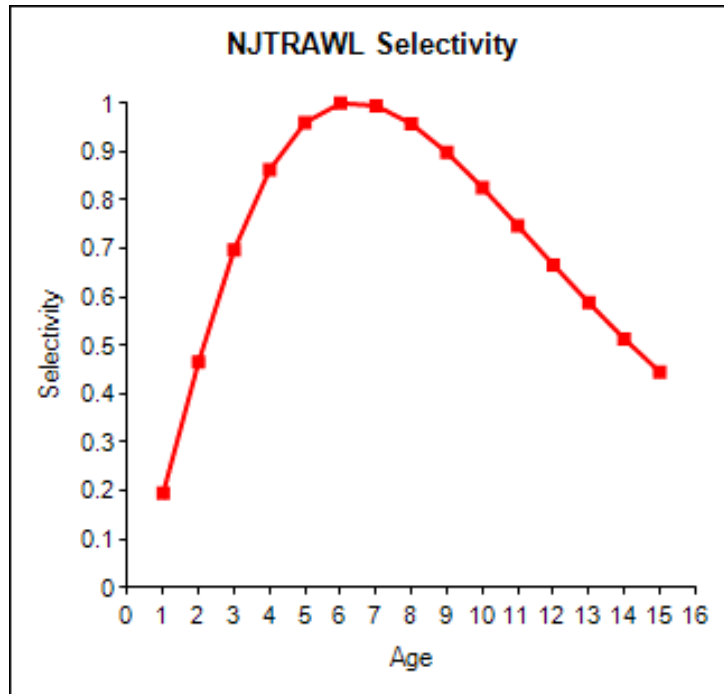
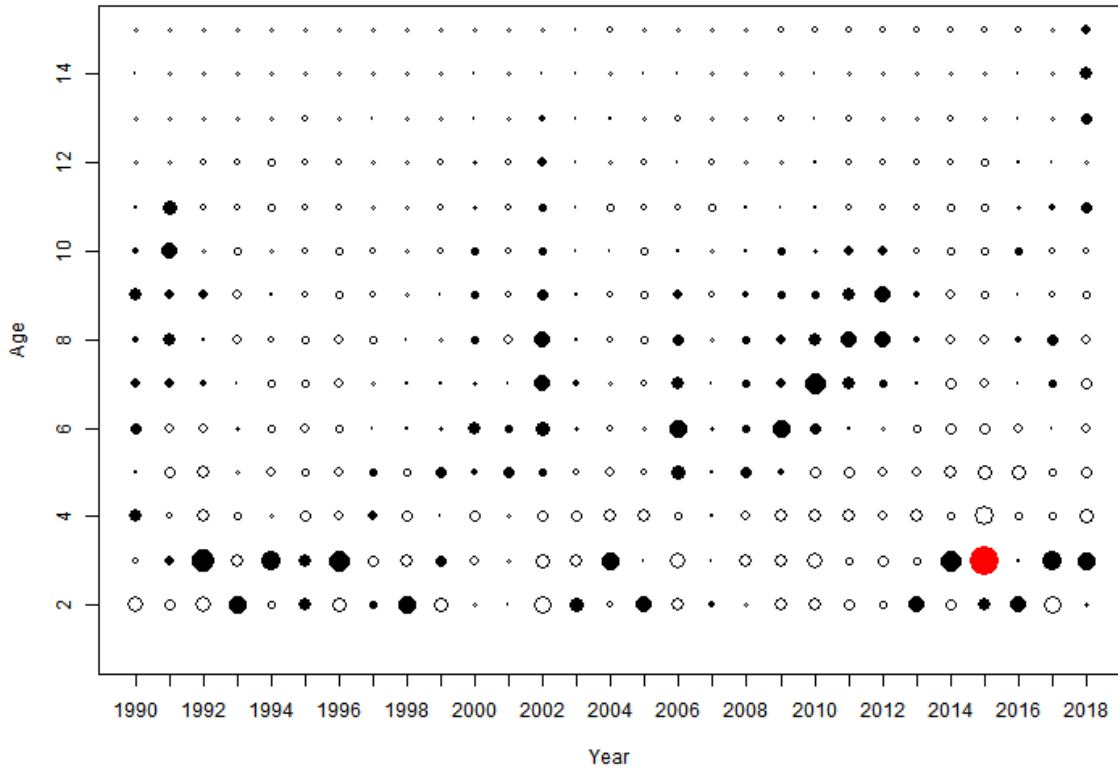


NJTrawl Age Residuals By Year



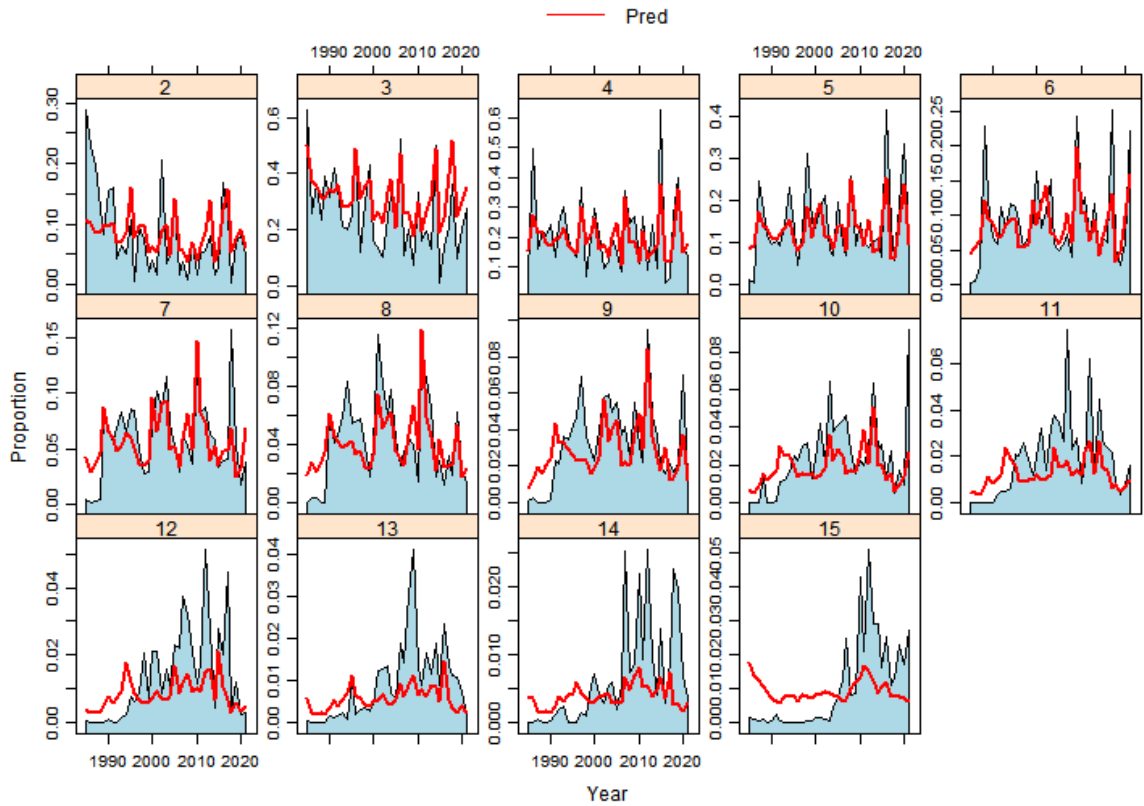
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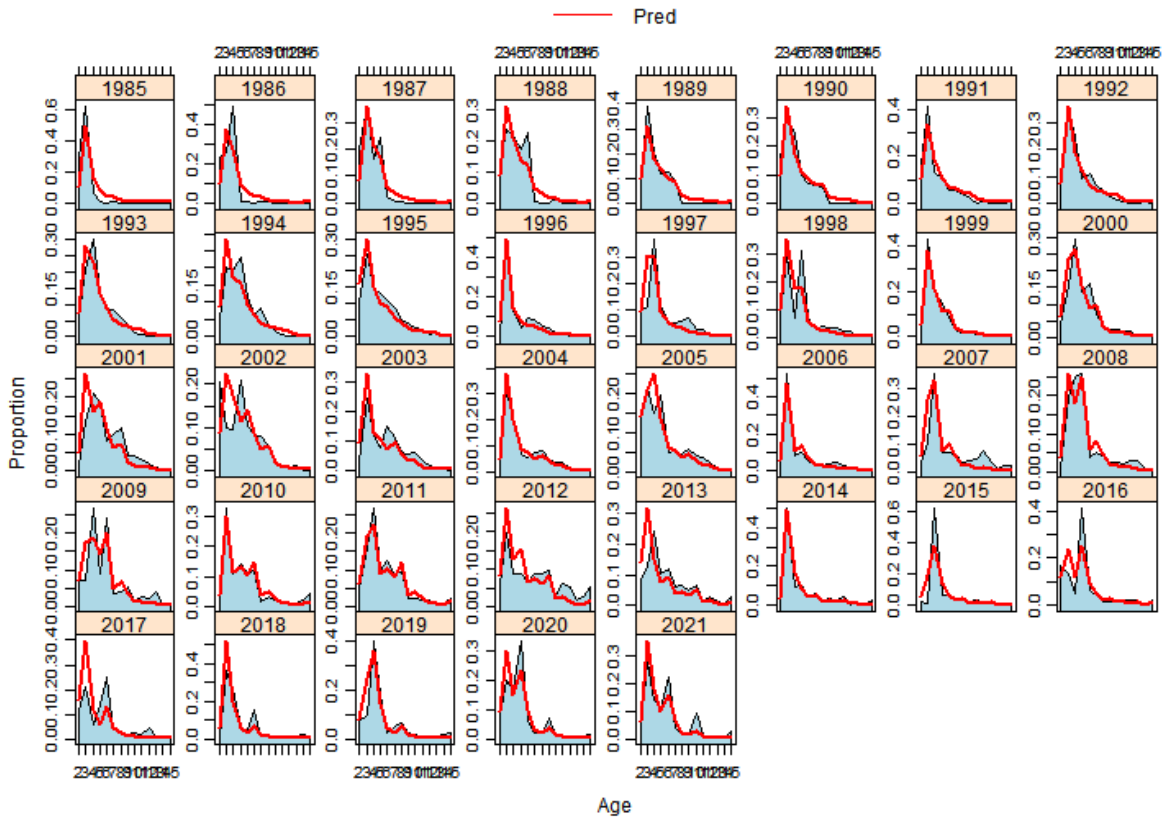


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MDSSN Age Composition By Age

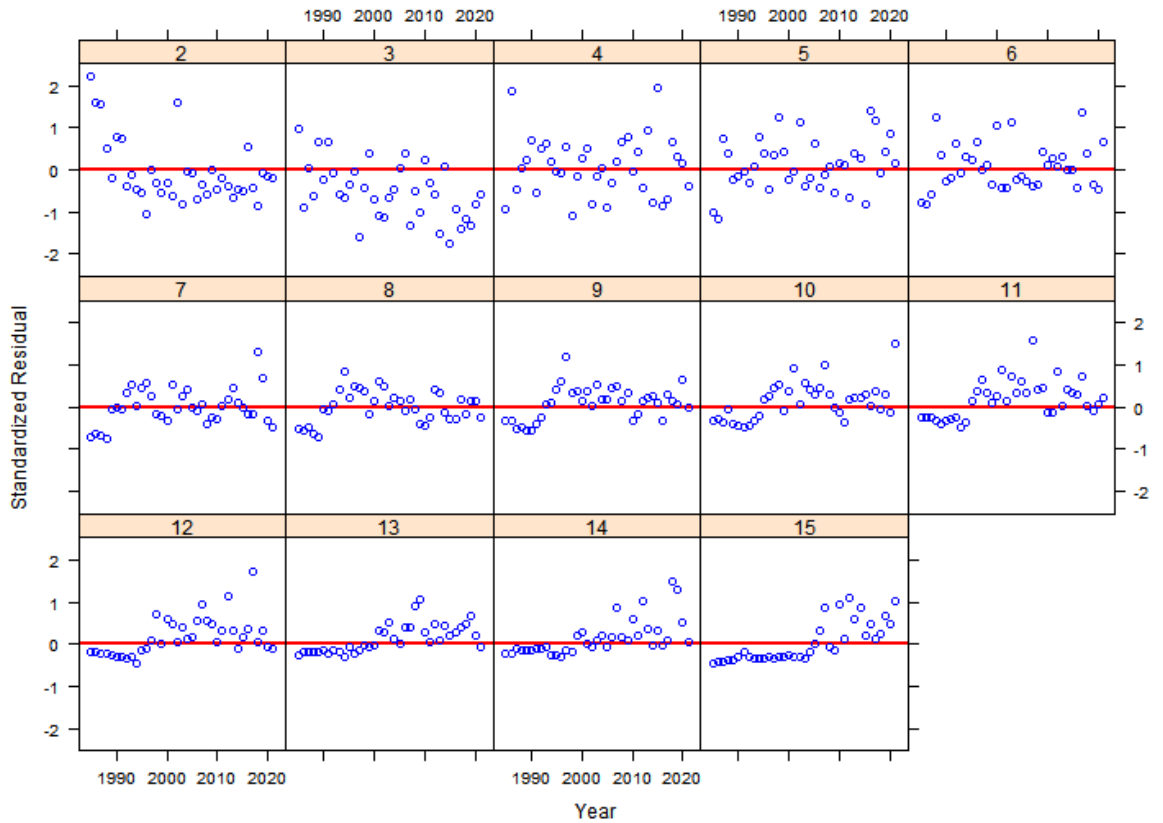


MDSSN Age Composition By Year

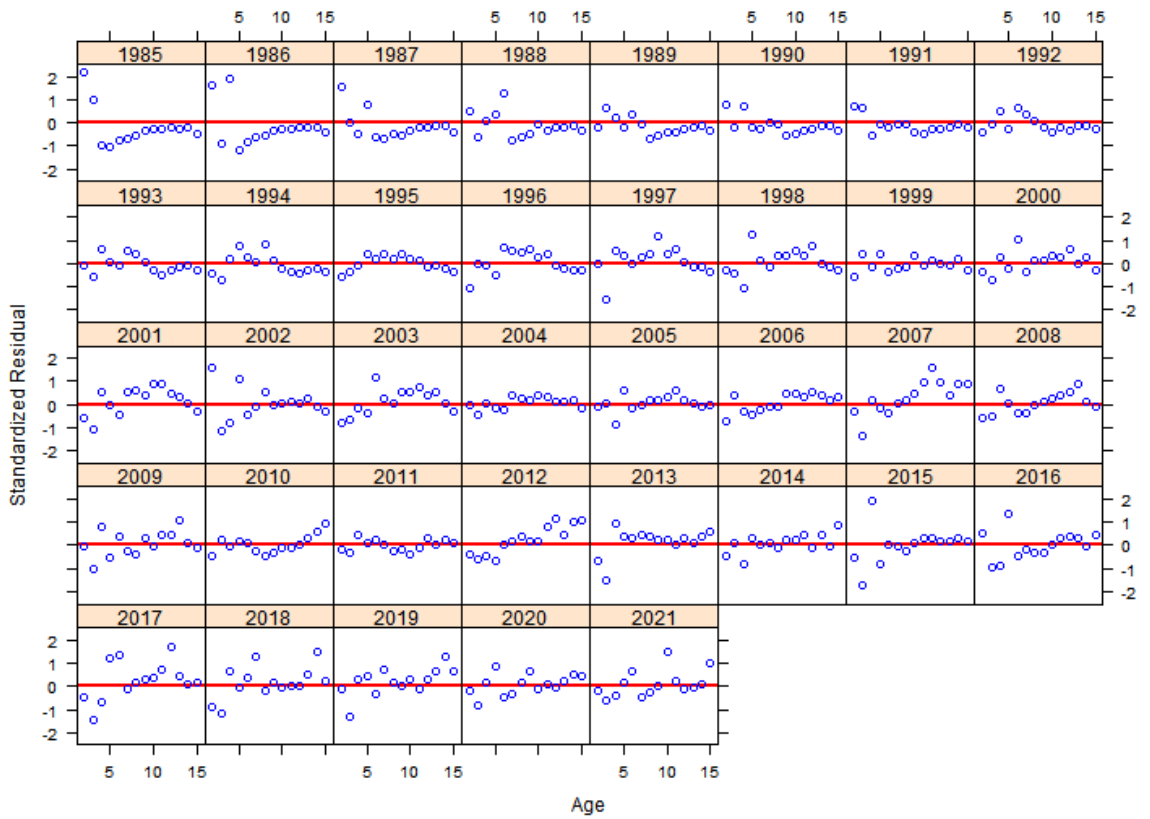


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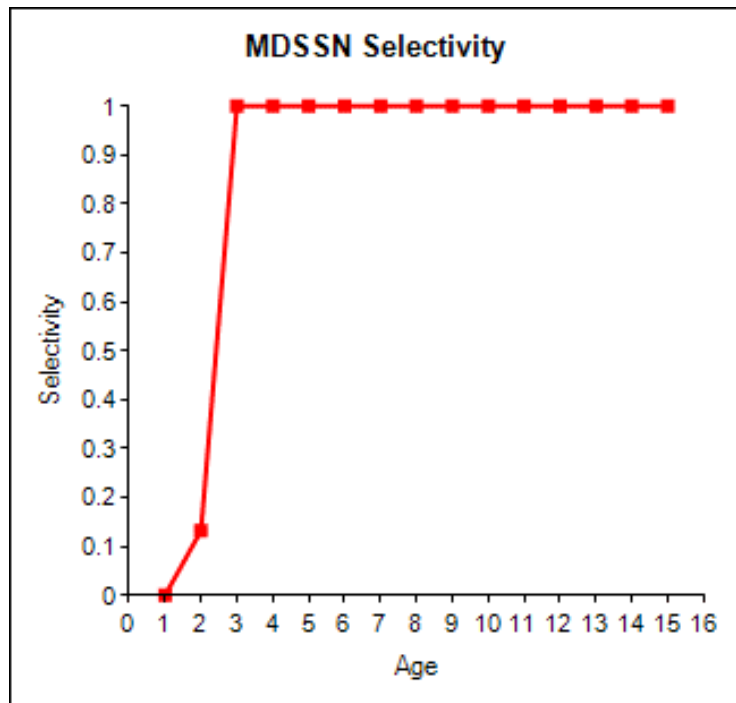
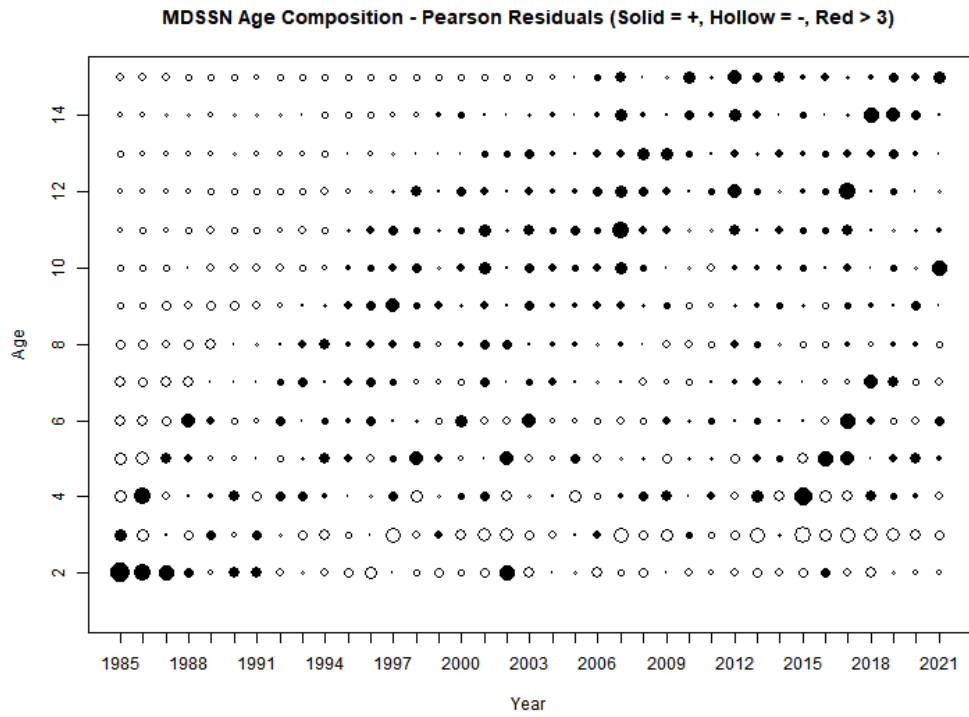
MDSN Age Residuals By Age



MDSN Age Residuals By Year

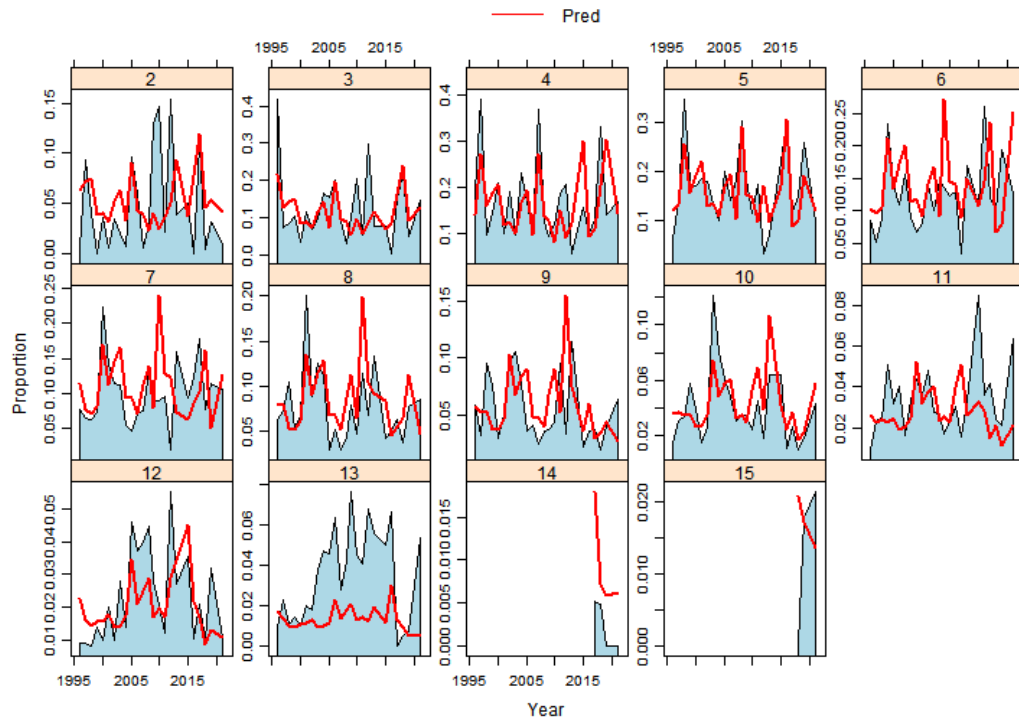


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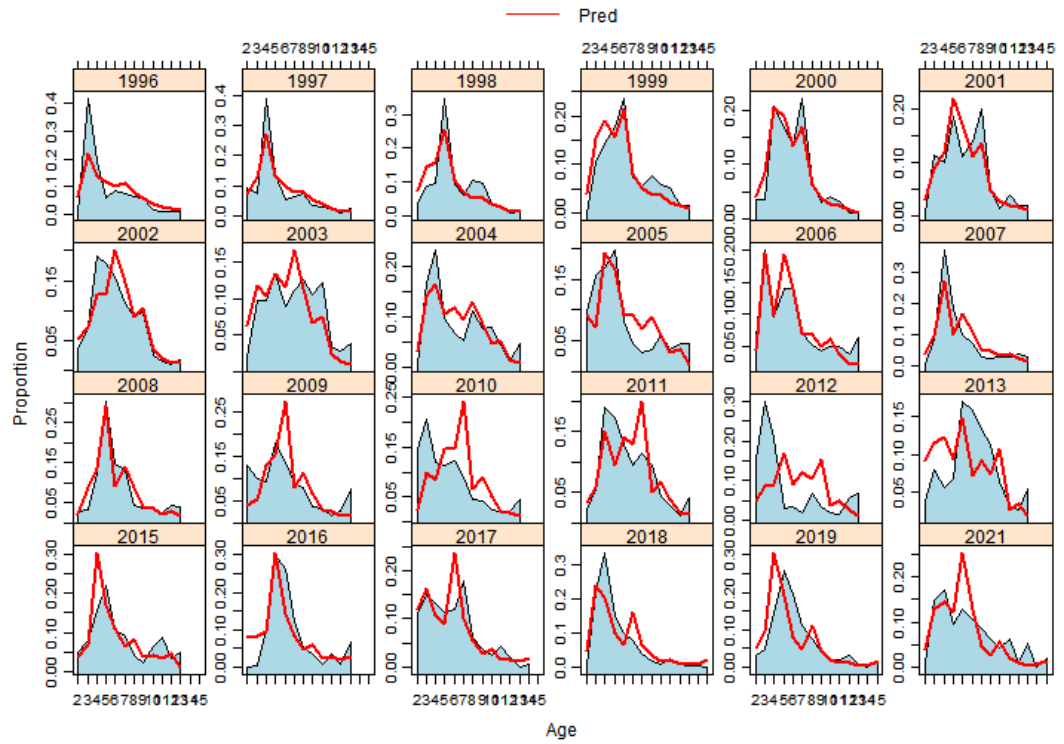


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DESSN Age Composition By Age

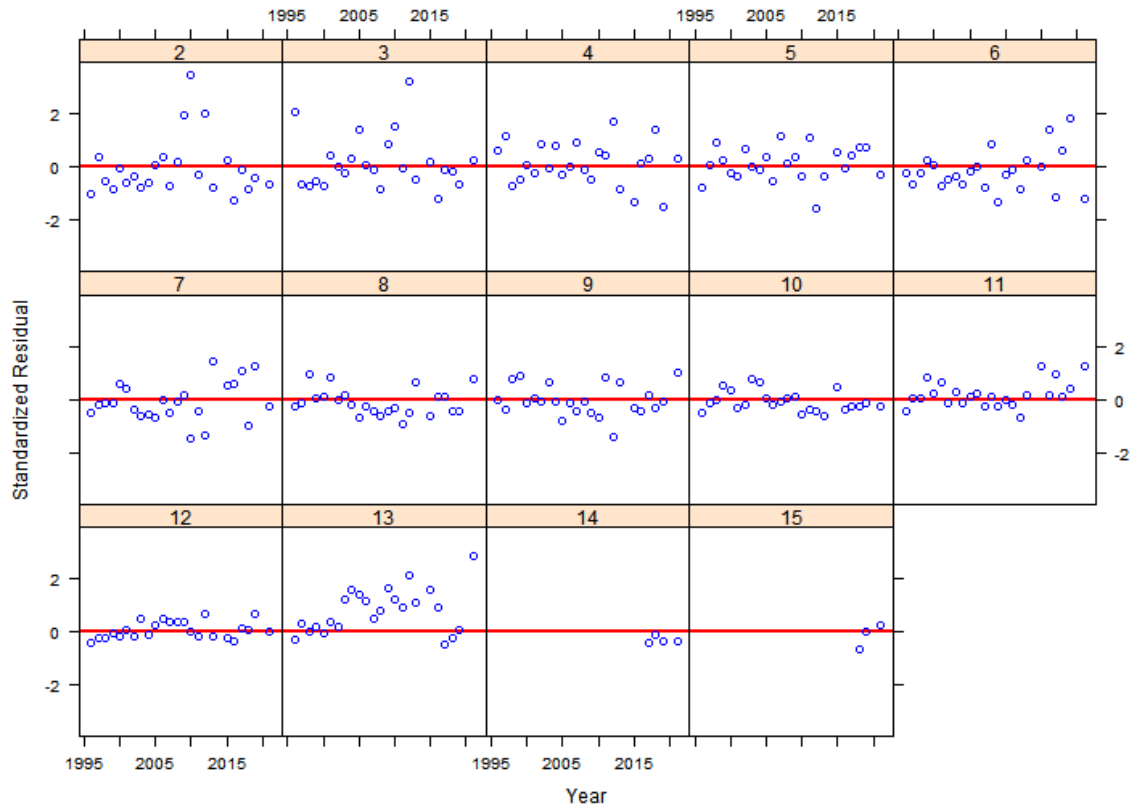


DESSN Age Composition By Year

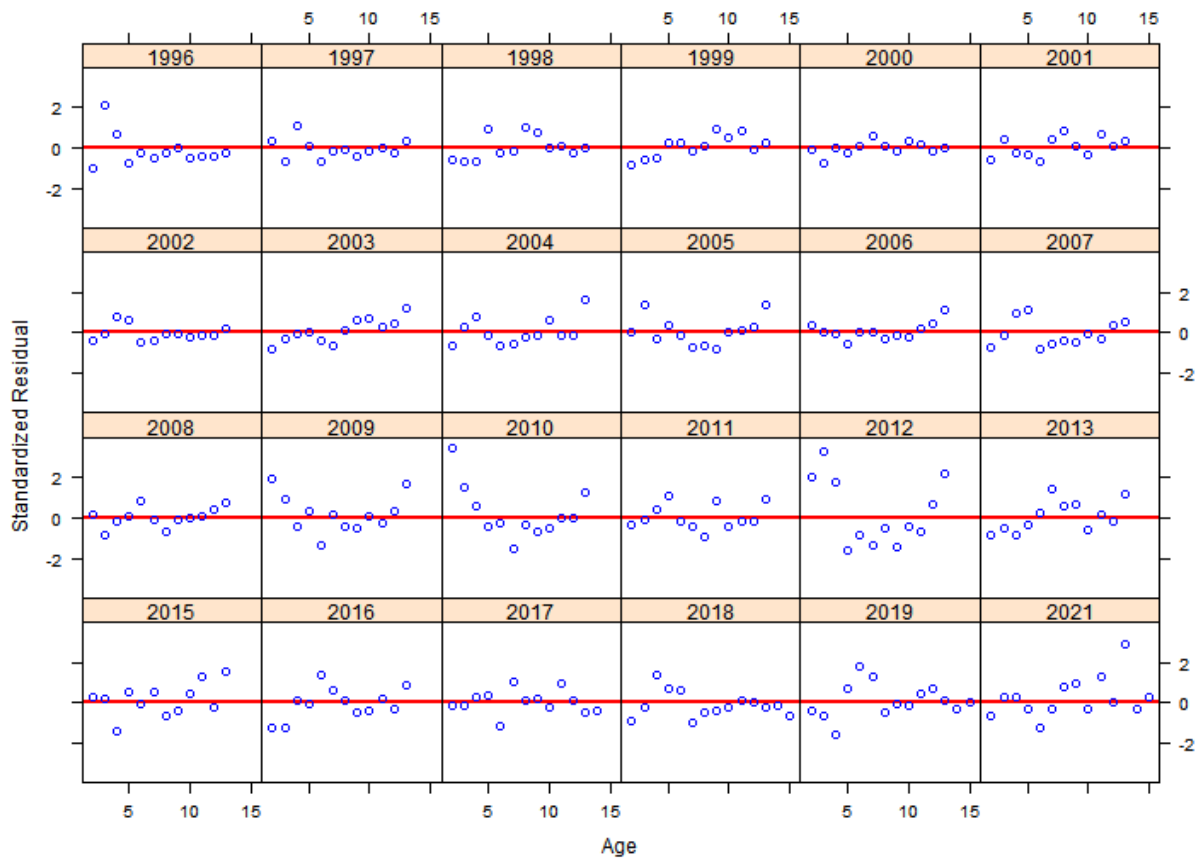


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DESSN Age Residuals By Age

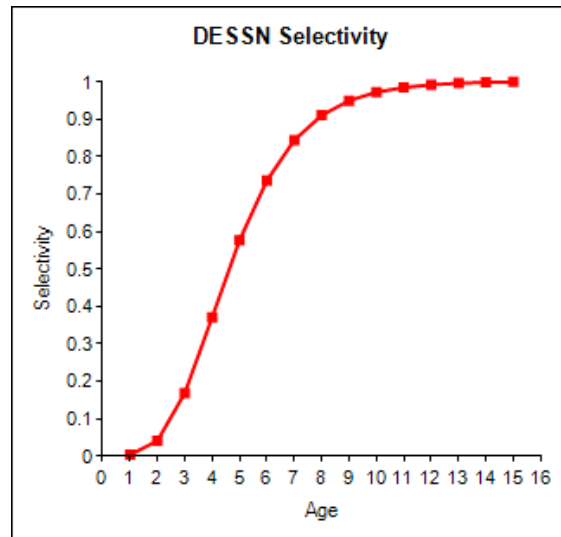
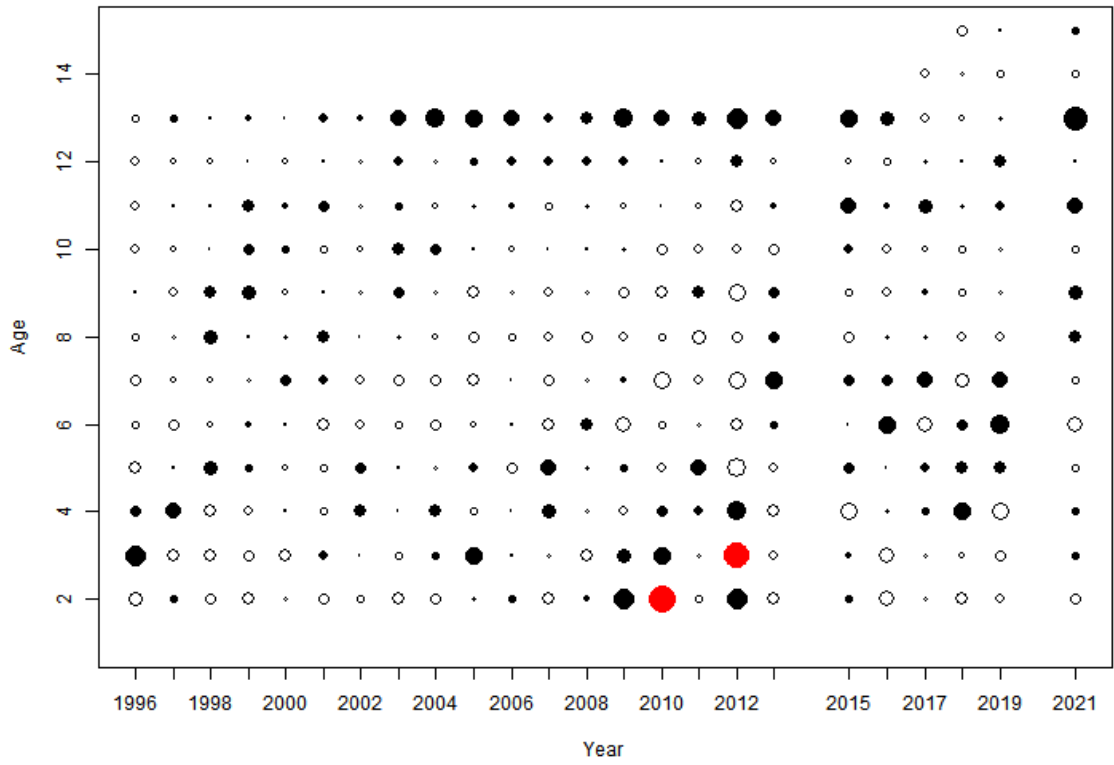


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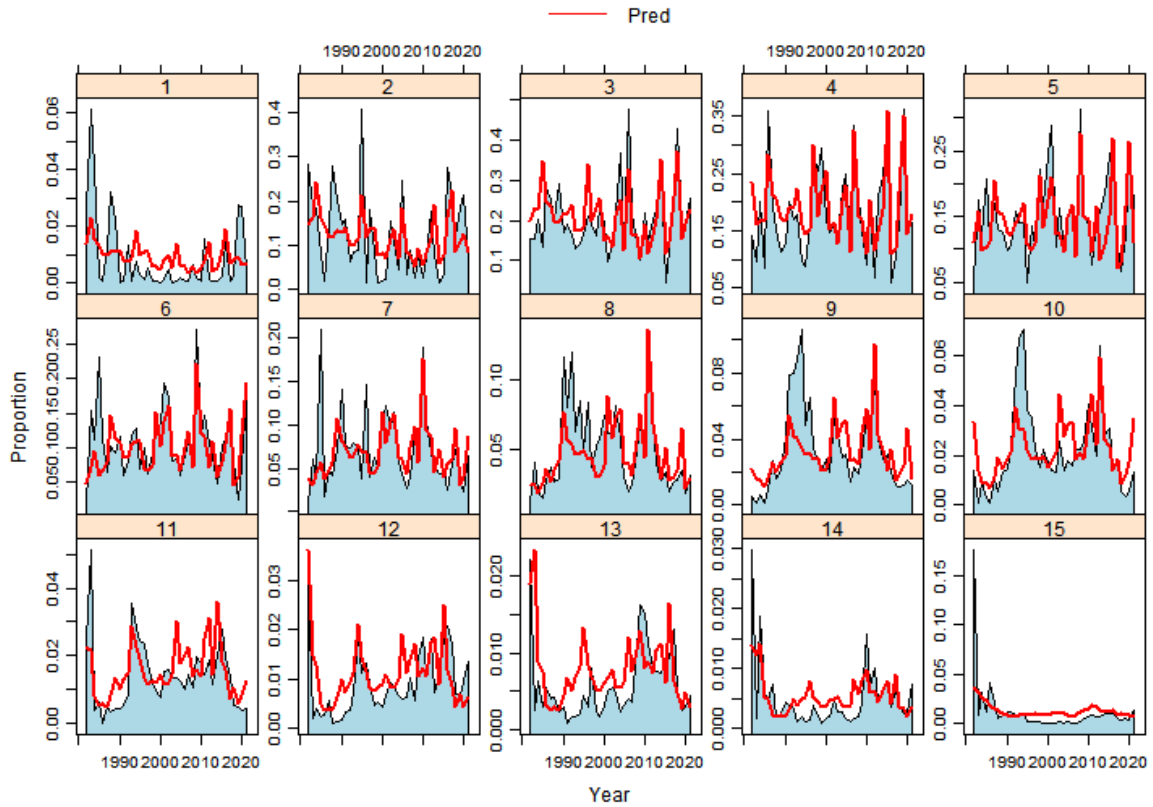
Draft for Board Review

DESSN Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)

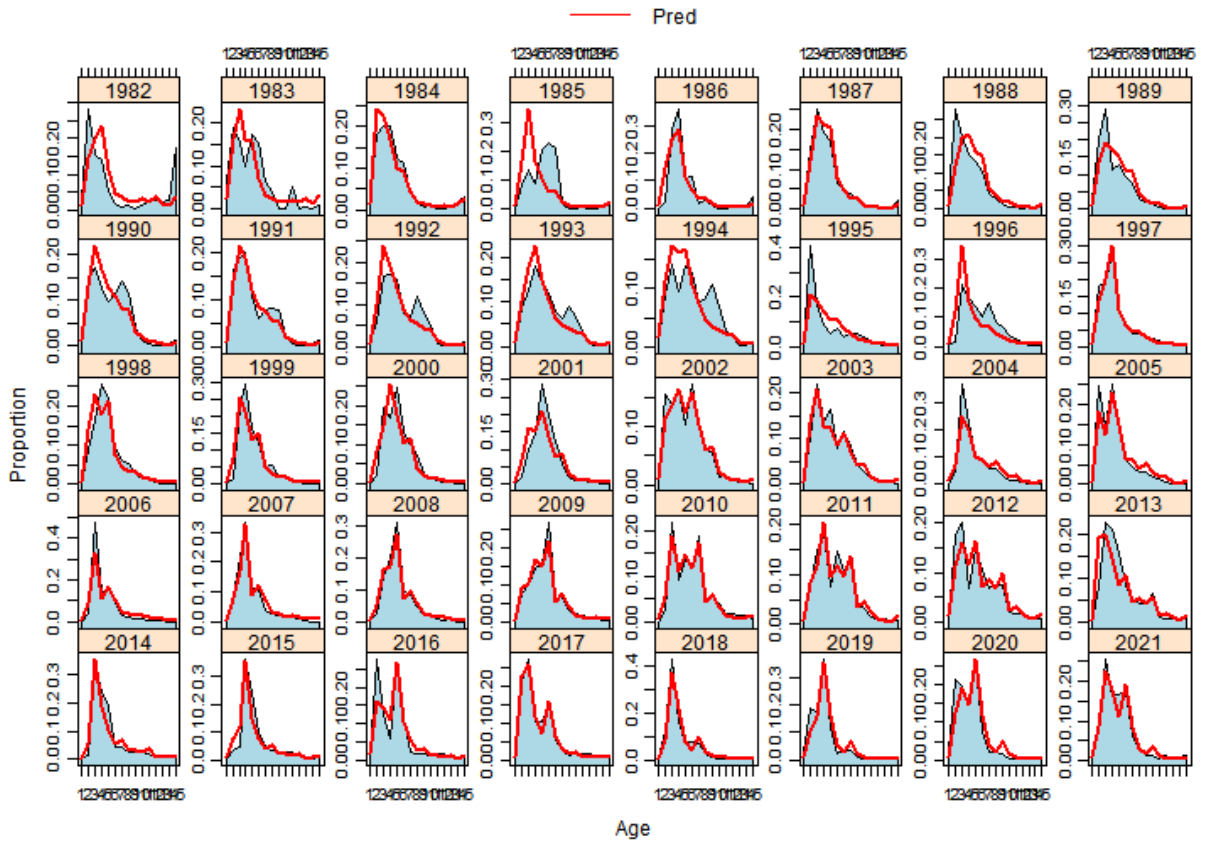


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MRIP Age Composition By Age

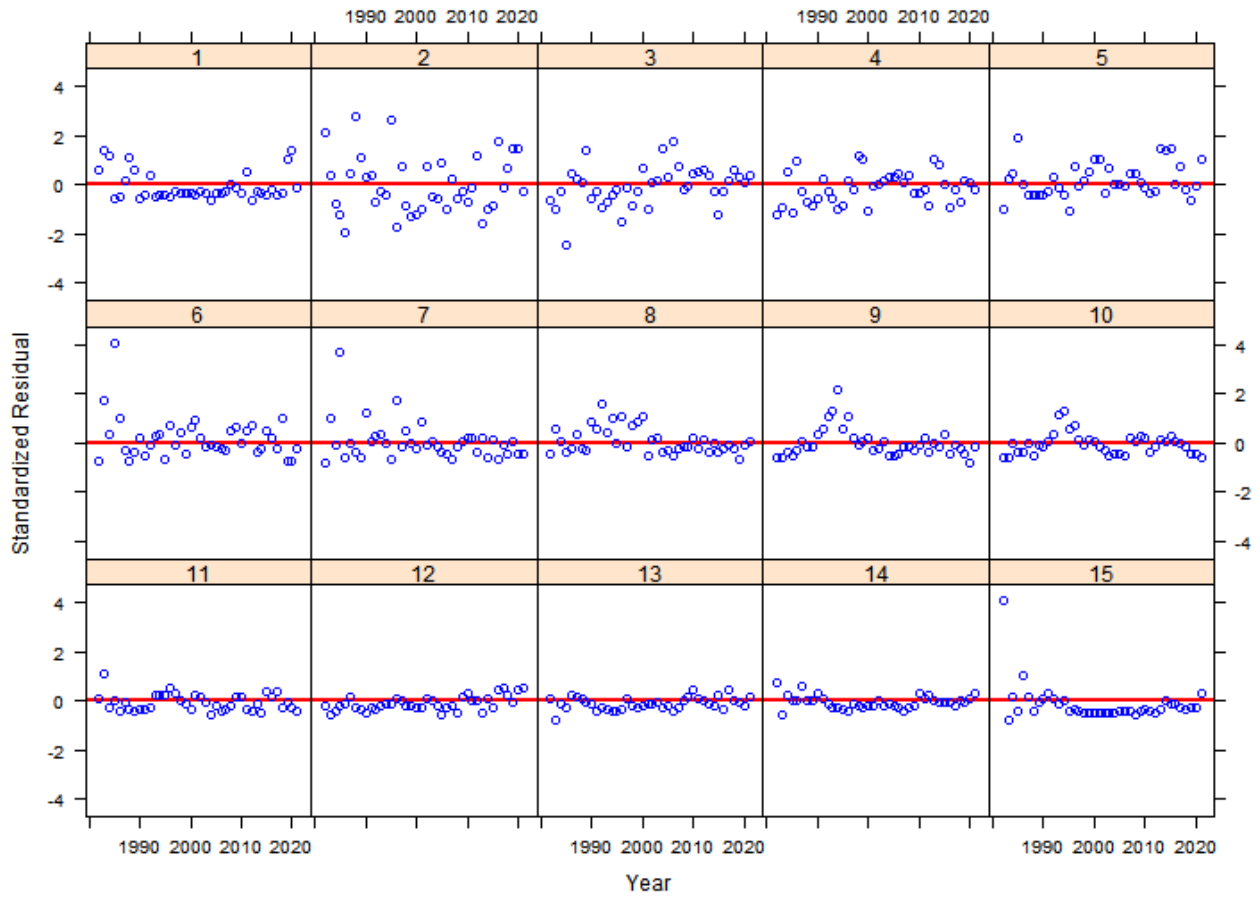


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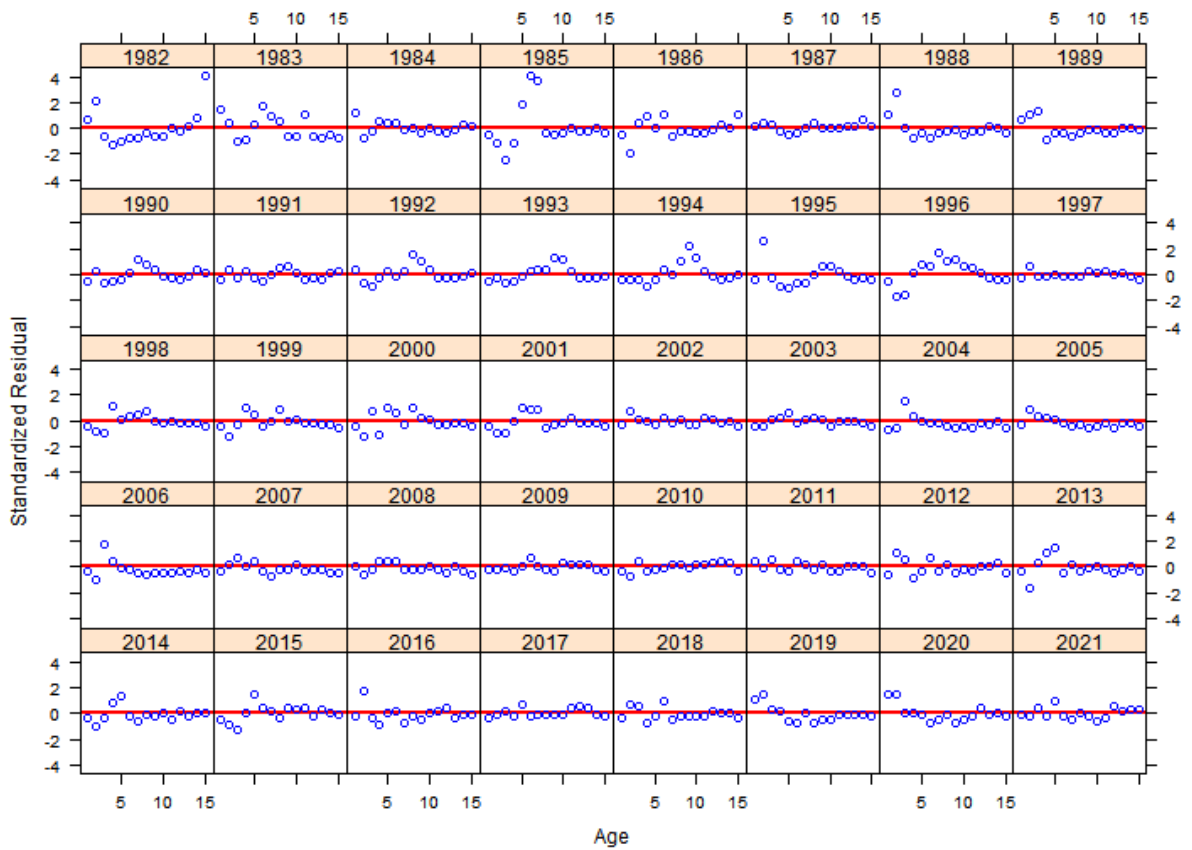


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MRIP Age Residuals By Age

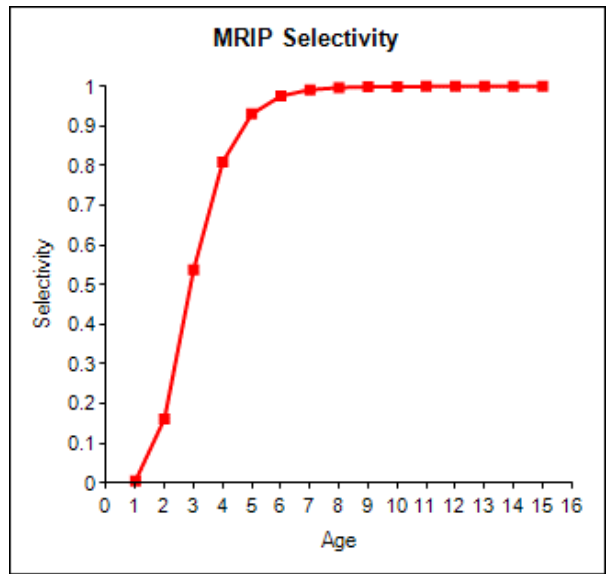
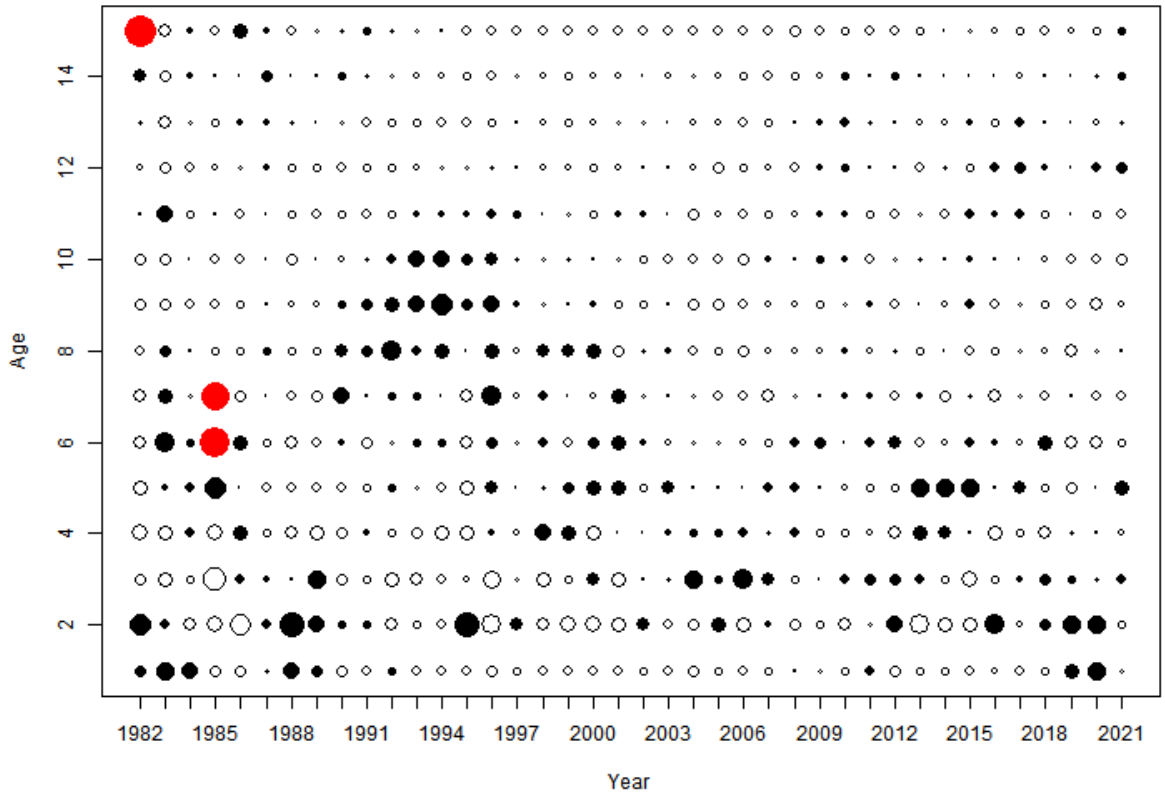


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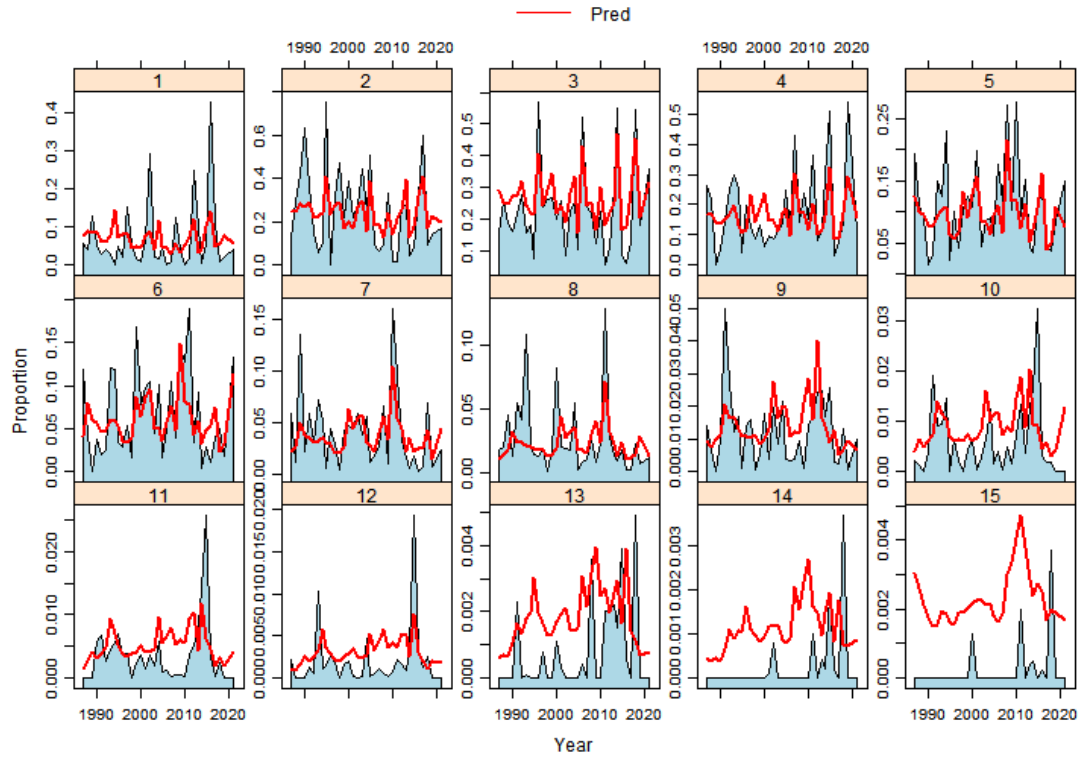
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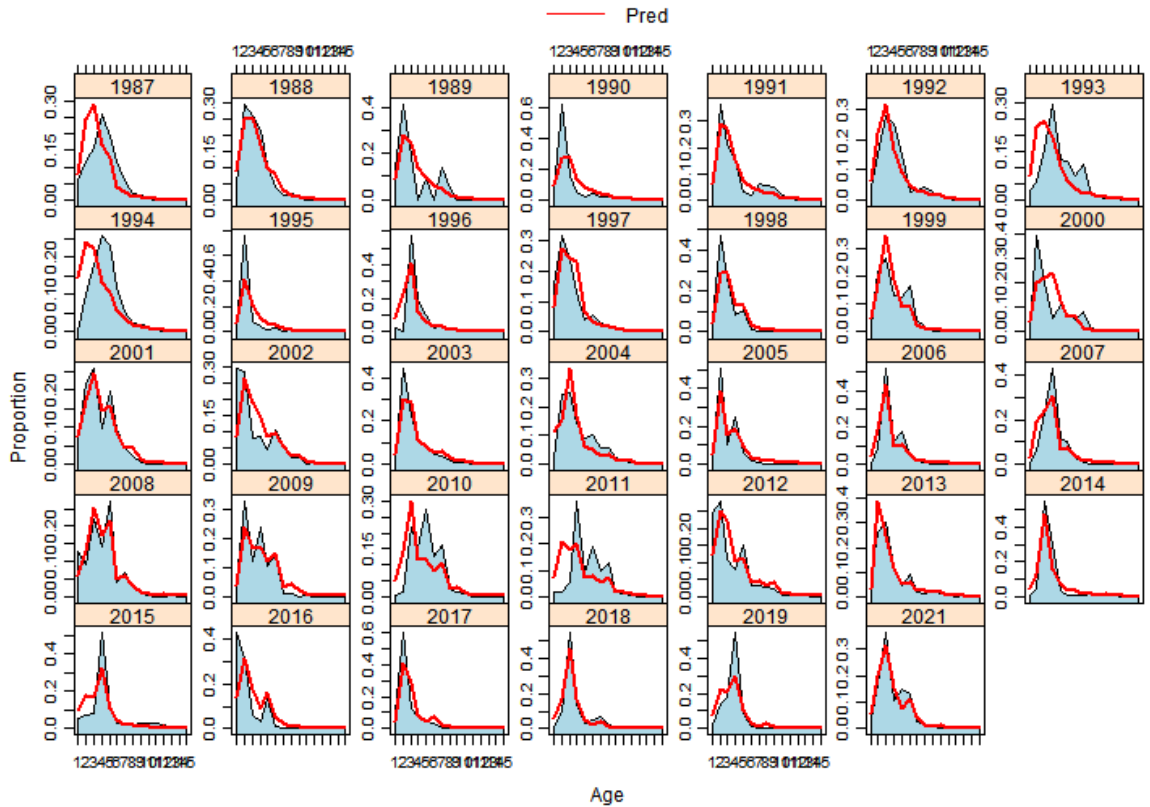


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CTLIST Age Composition By Age



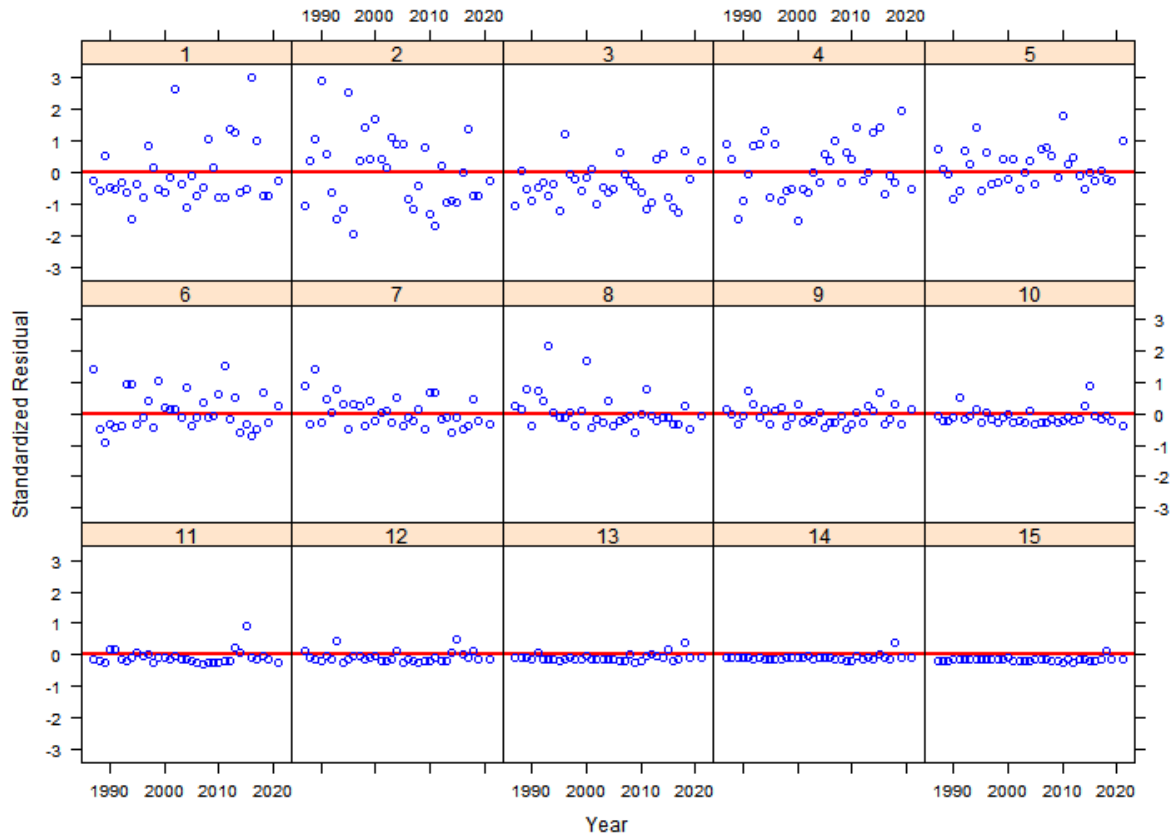
CTLIST Age Composition By Year



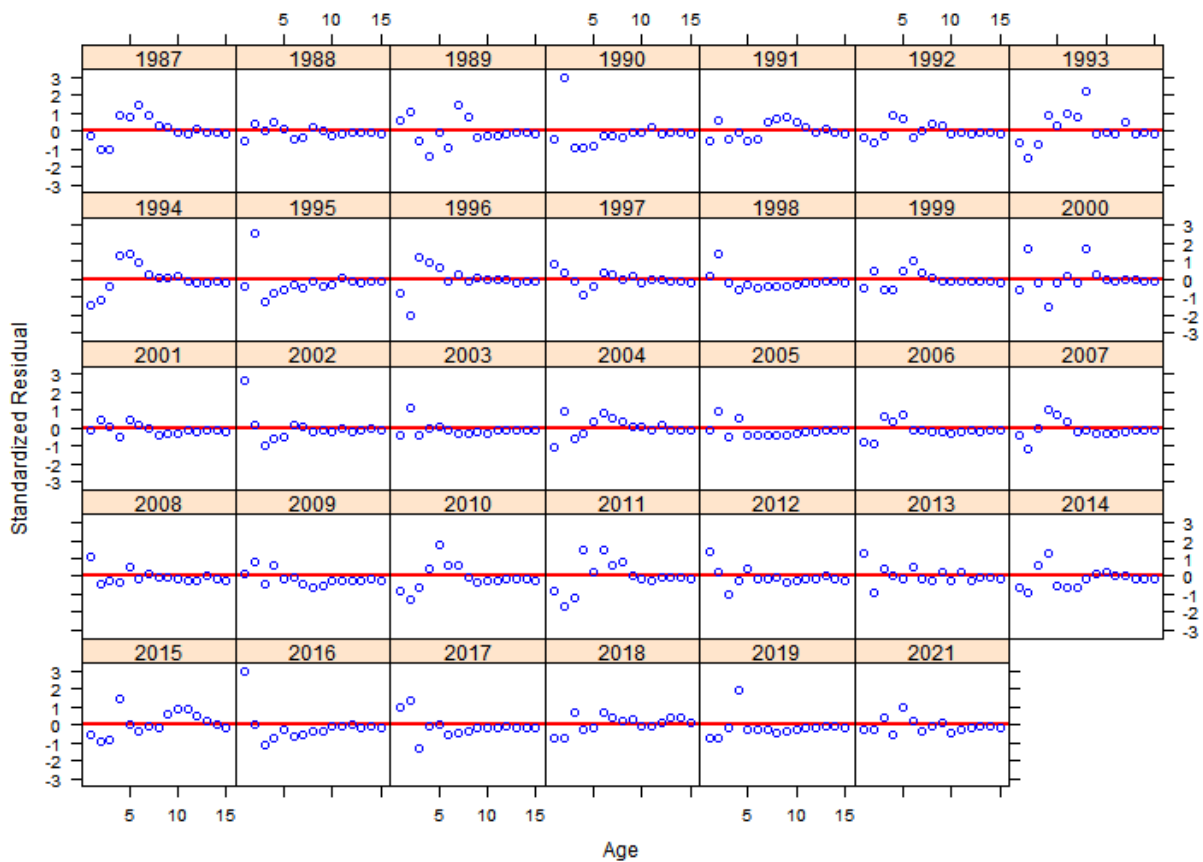
Draft for Board Review

Draft for Board Review

CTLIST Age Residuals By Age

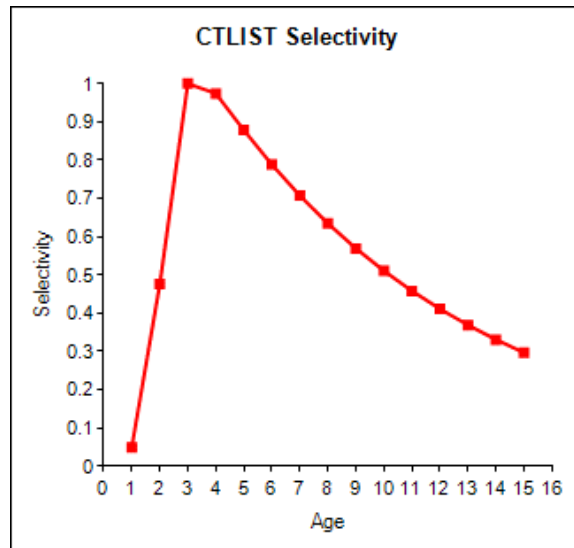
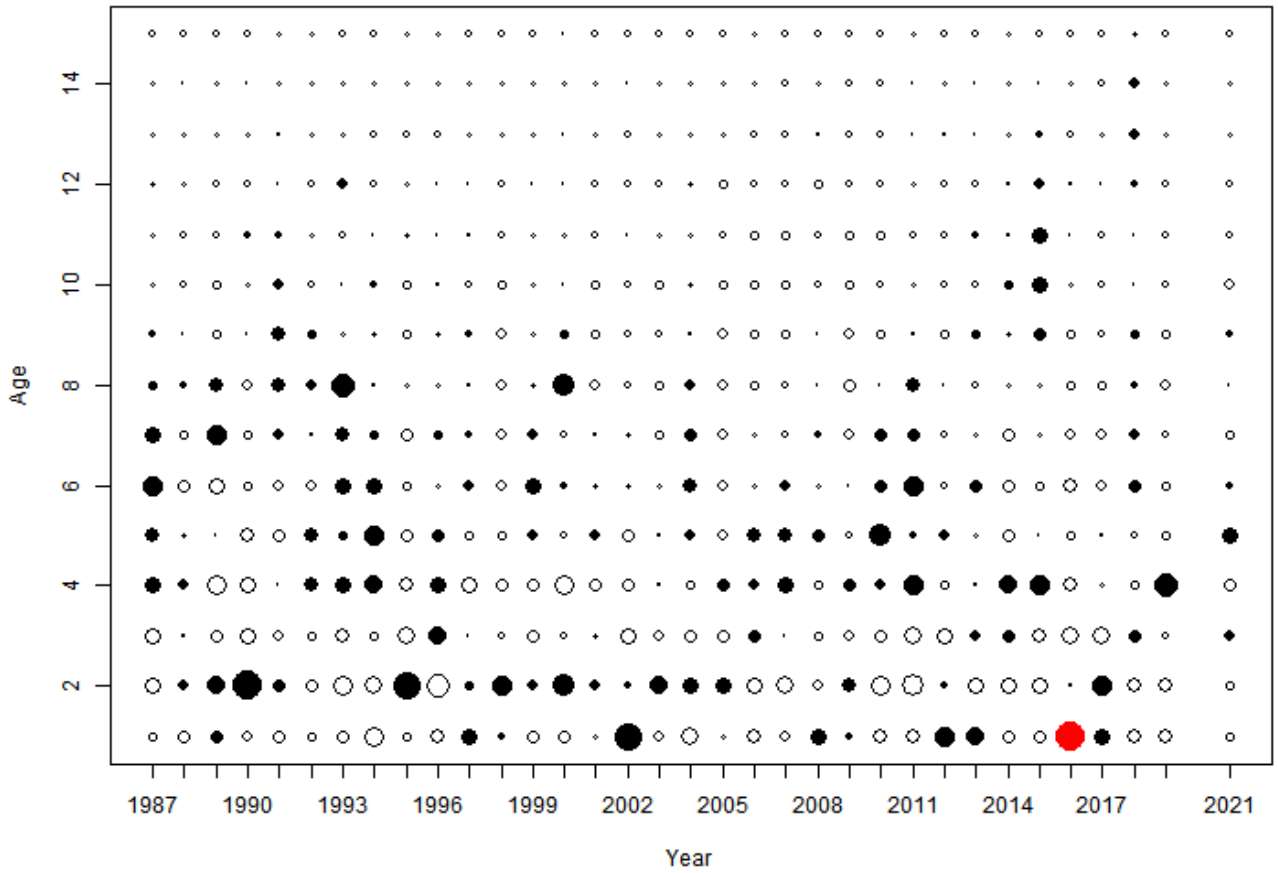


CTLIST Age Residuals By Year



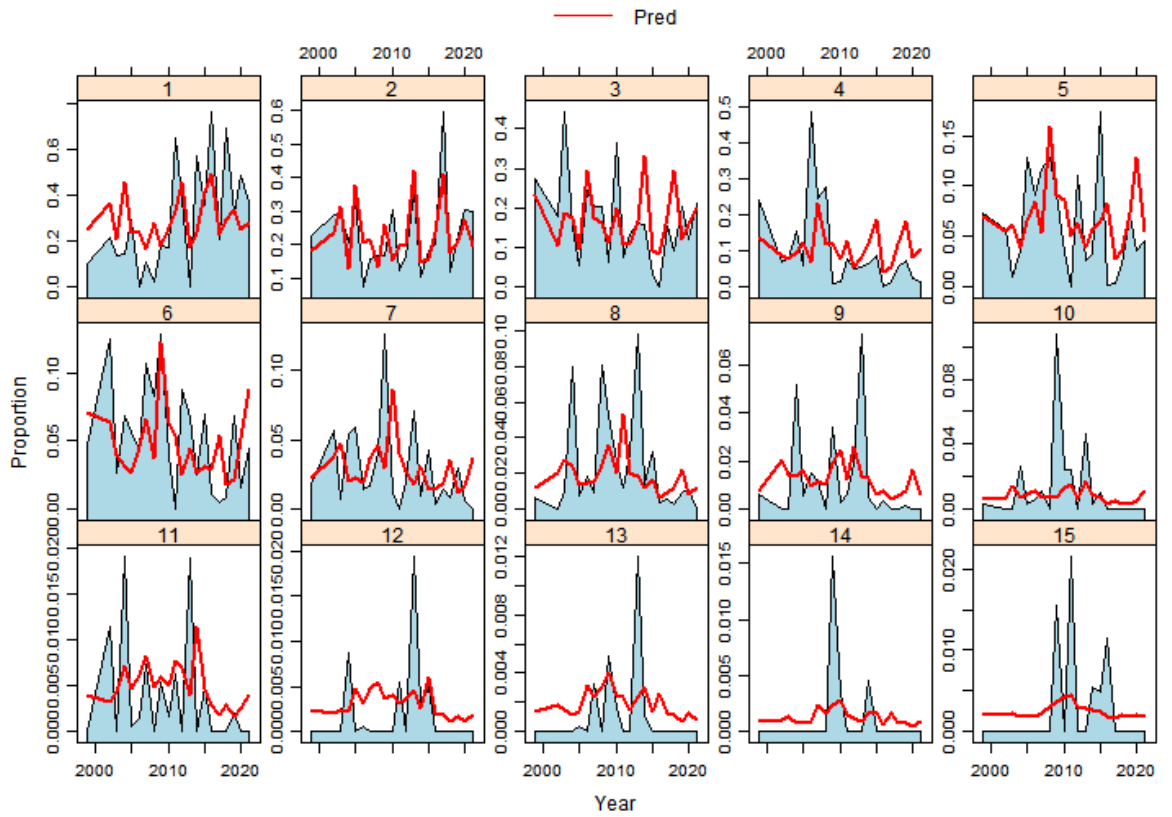
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CTLIST Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)

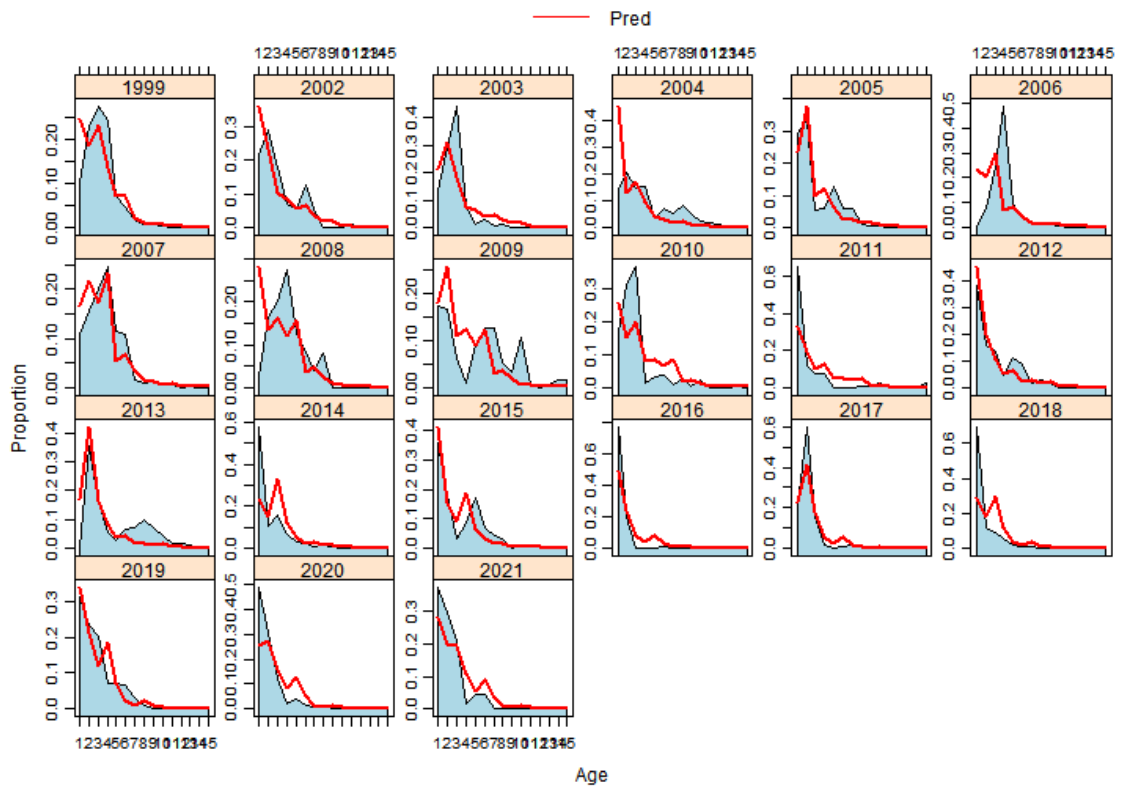


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DE30FT Age Composition By Age

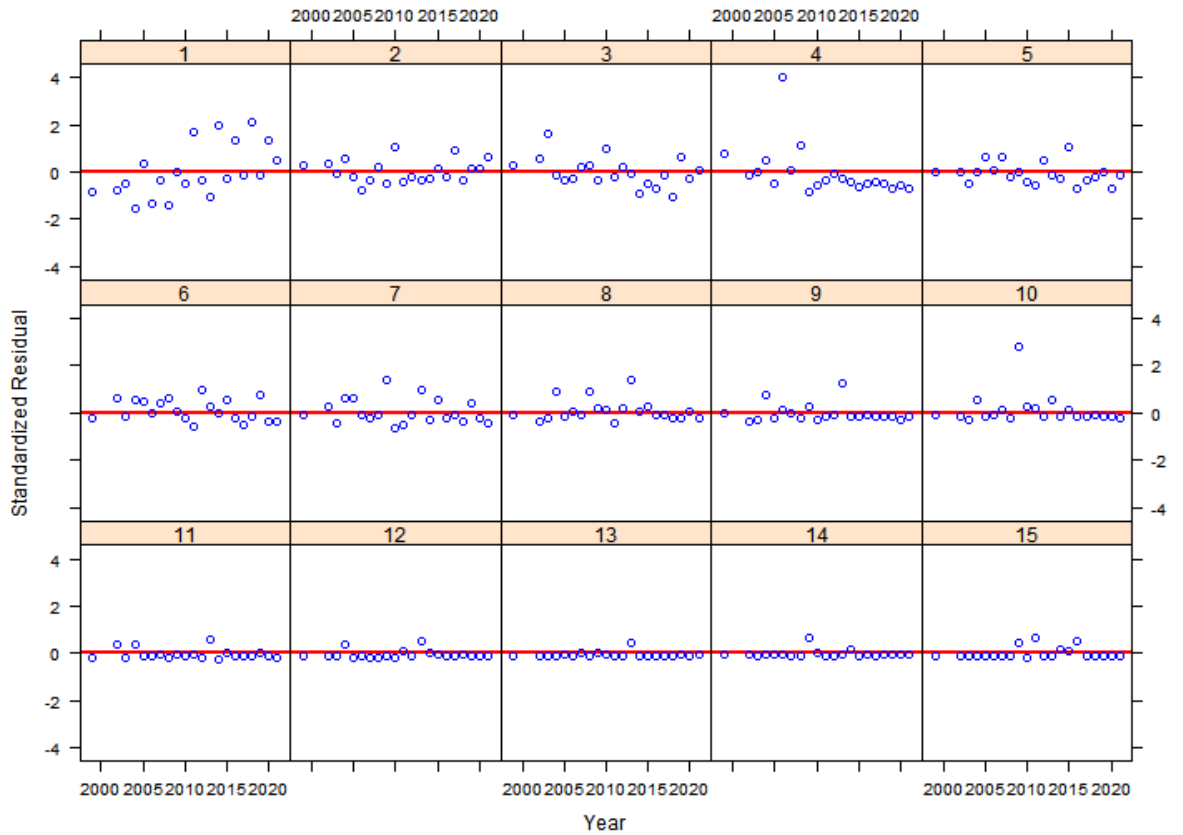


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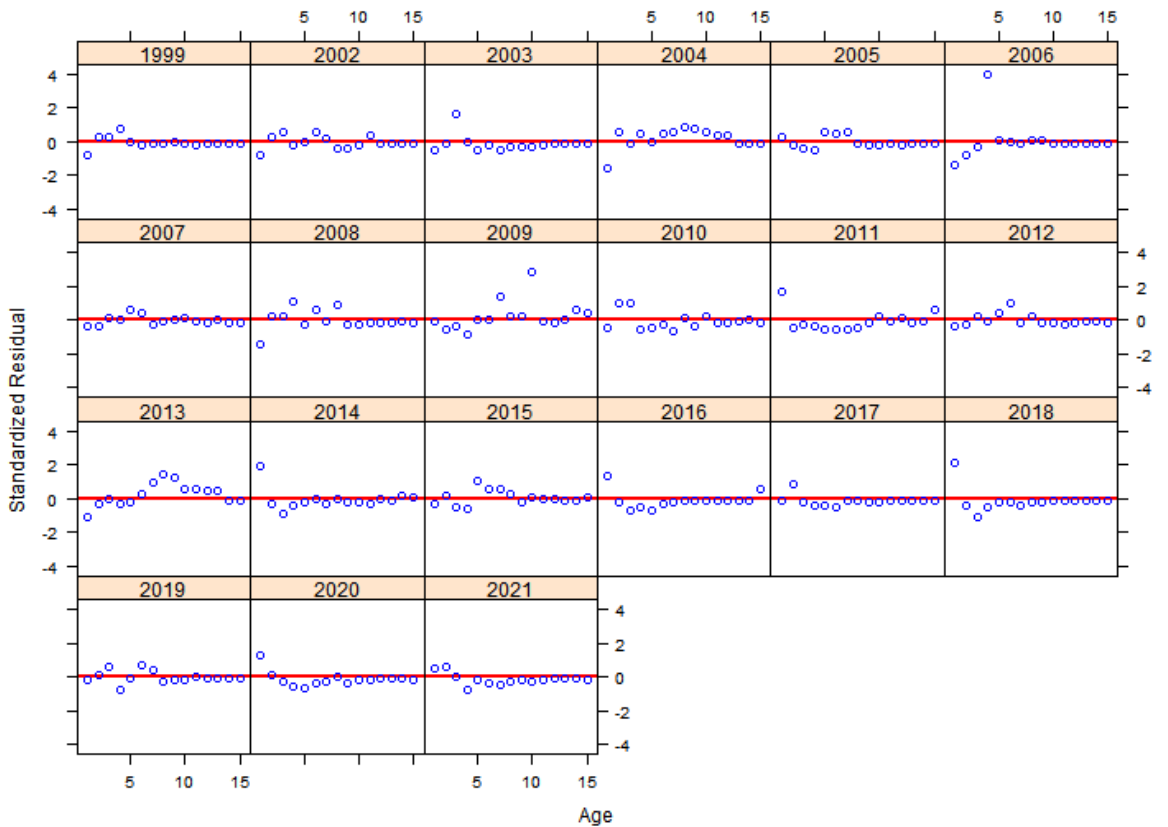


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DE30FT Age Residuals By Age

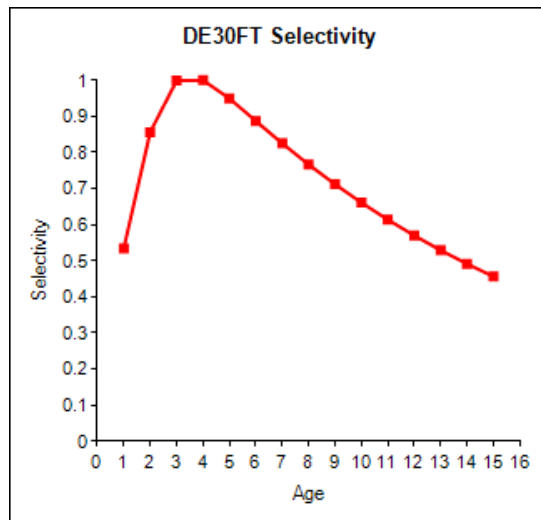
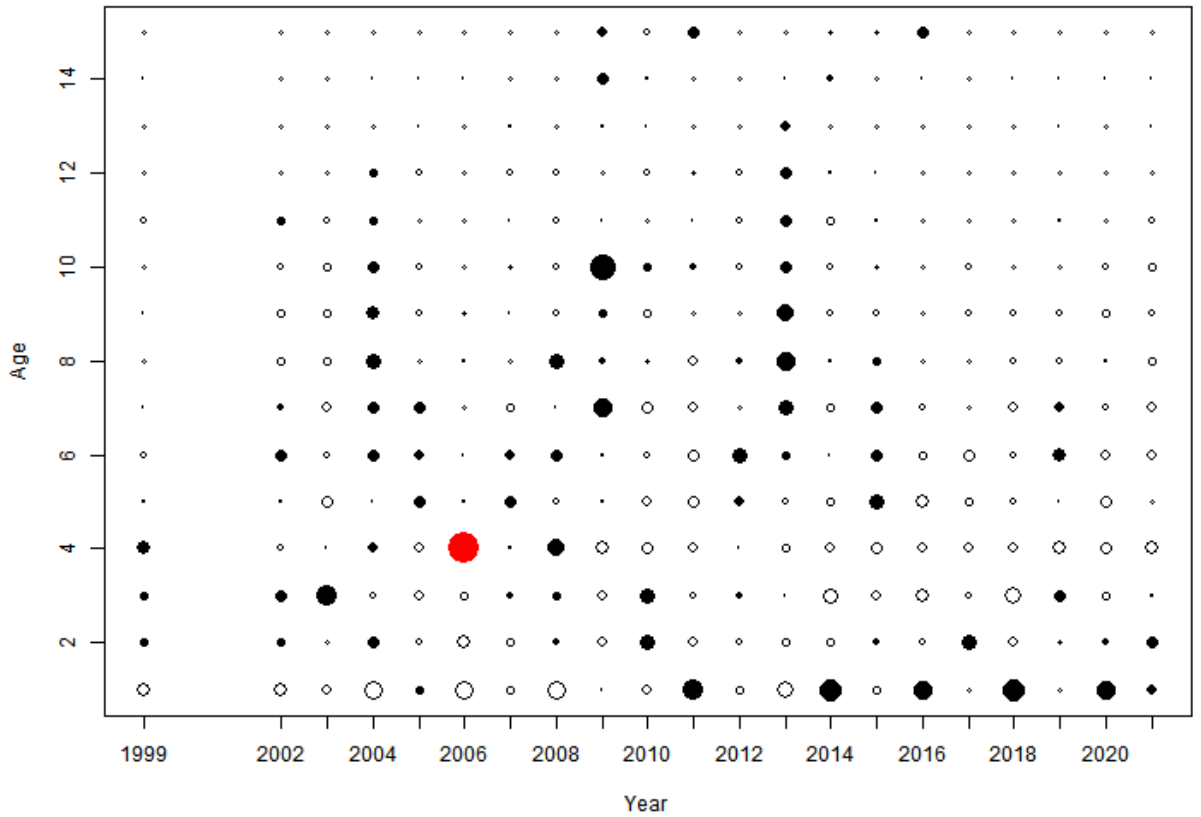


DE30FT Age Residuals By Year



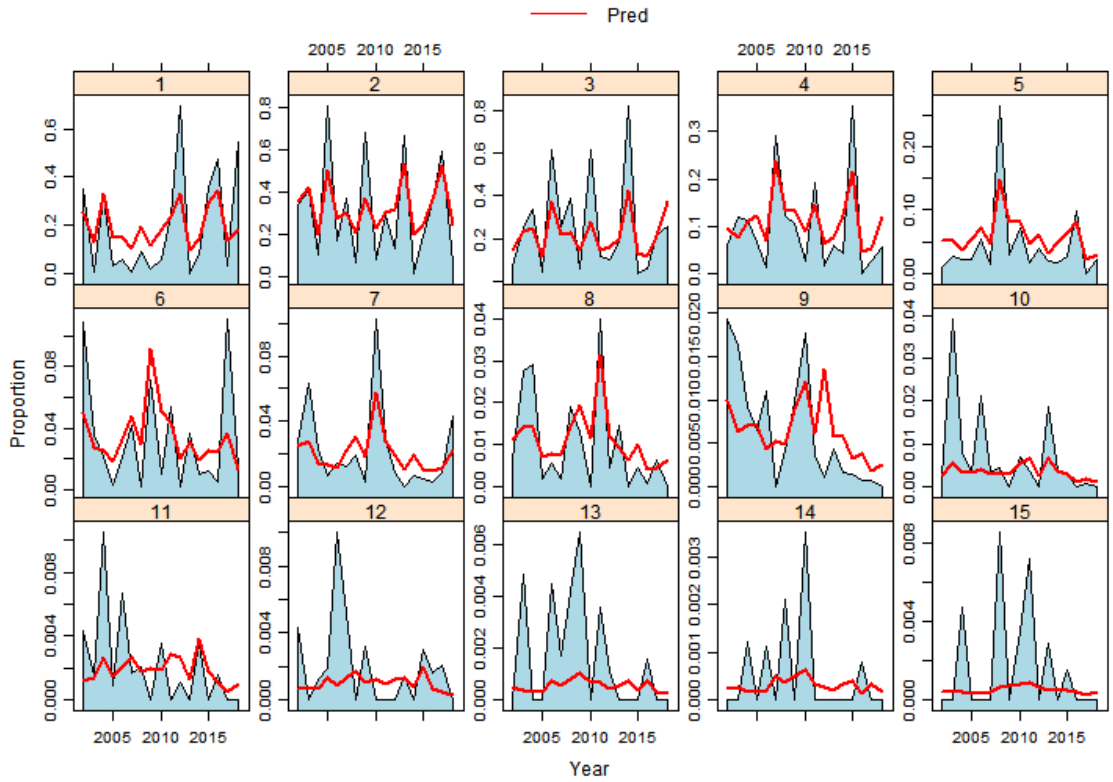
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DE30FT Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)

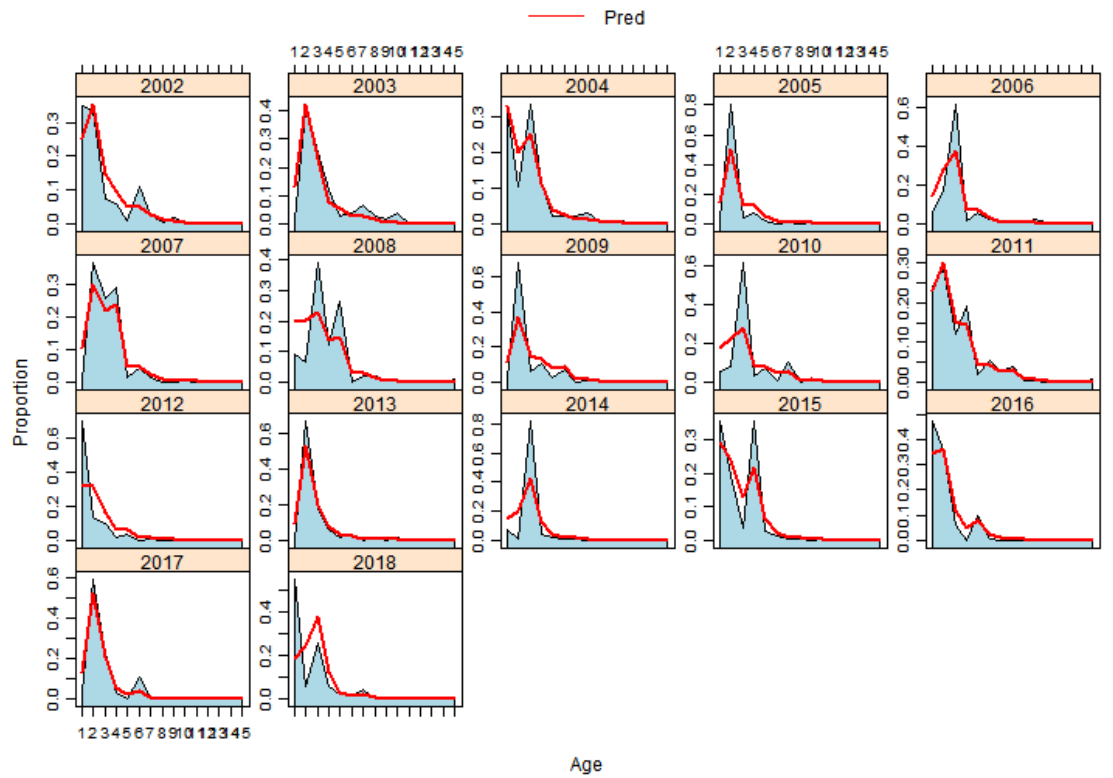


Draft for Board Review

CHESMAP Age Composition By Age

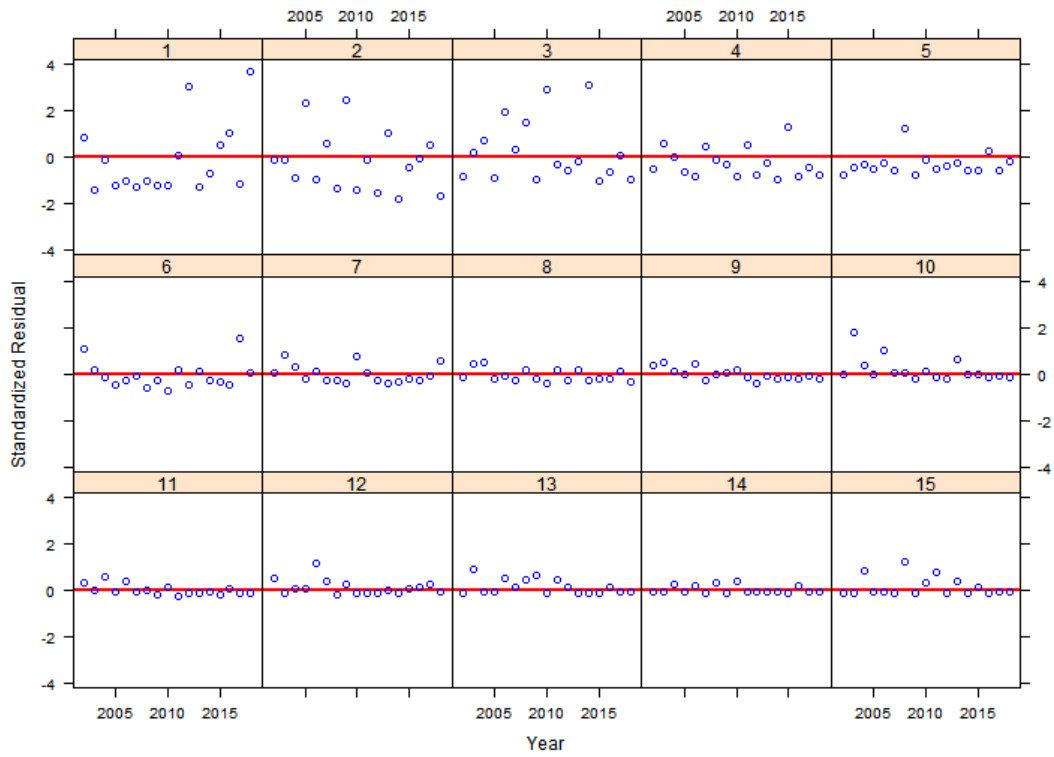


CHESMAP Age Composition By Year

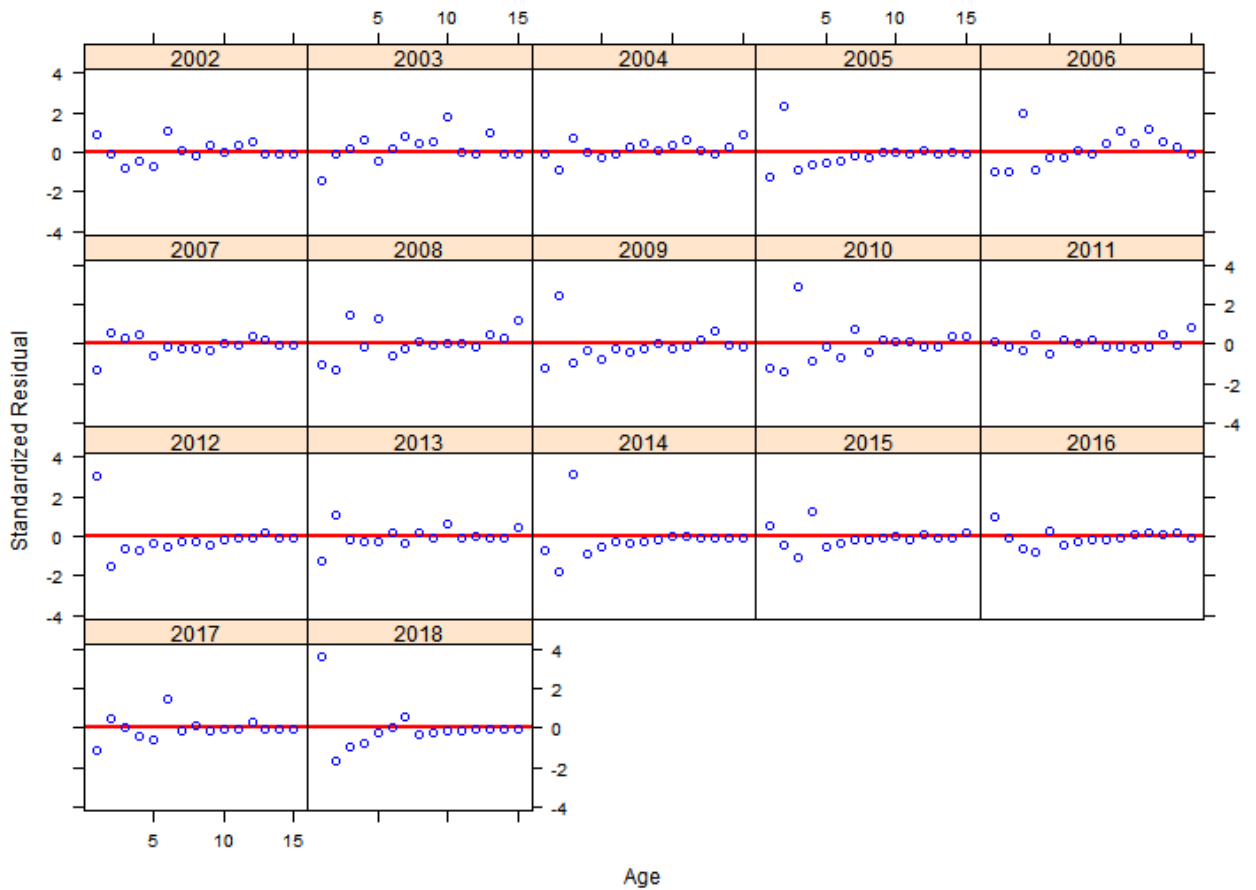


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CHESMAP Age Residuals By Age

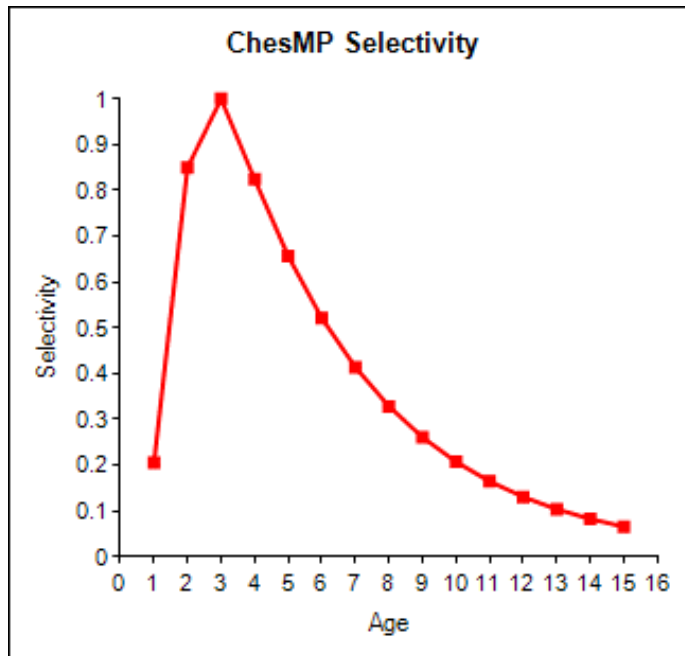
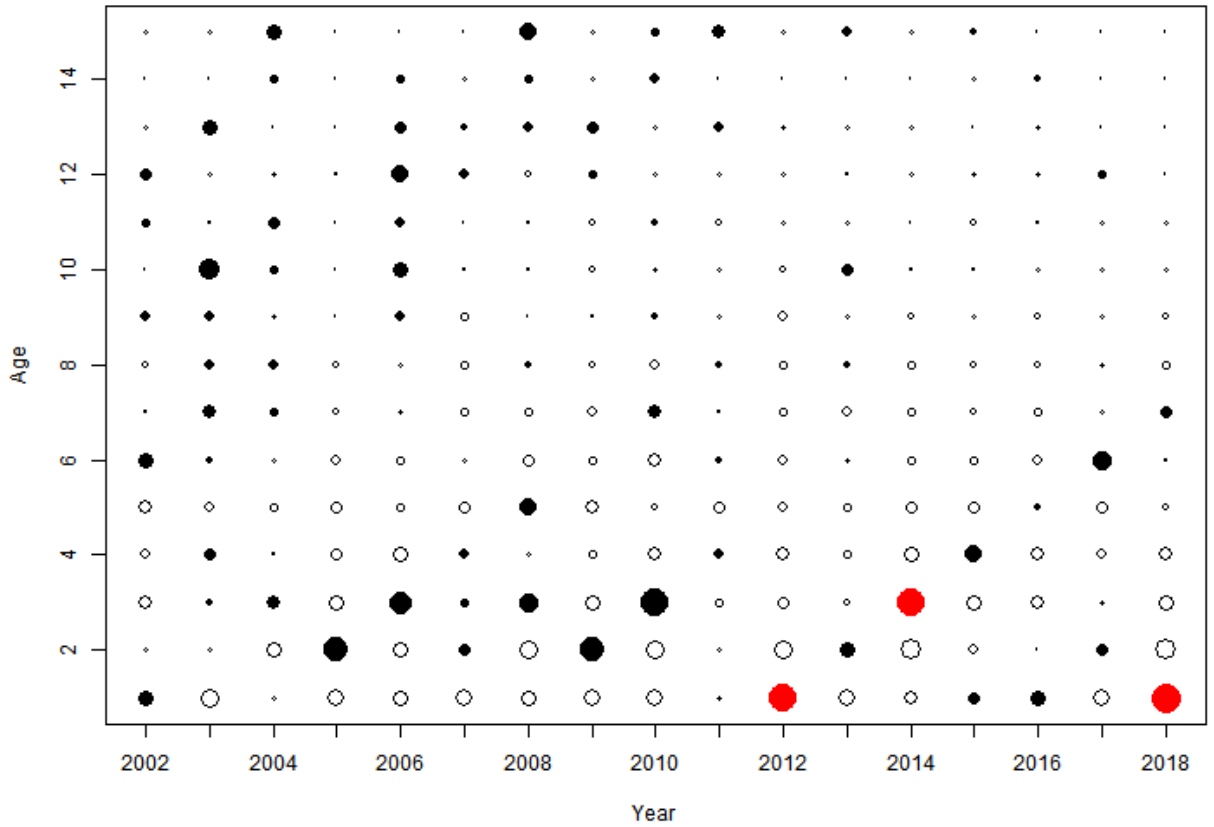


CHESMAP Age Residuals By Year

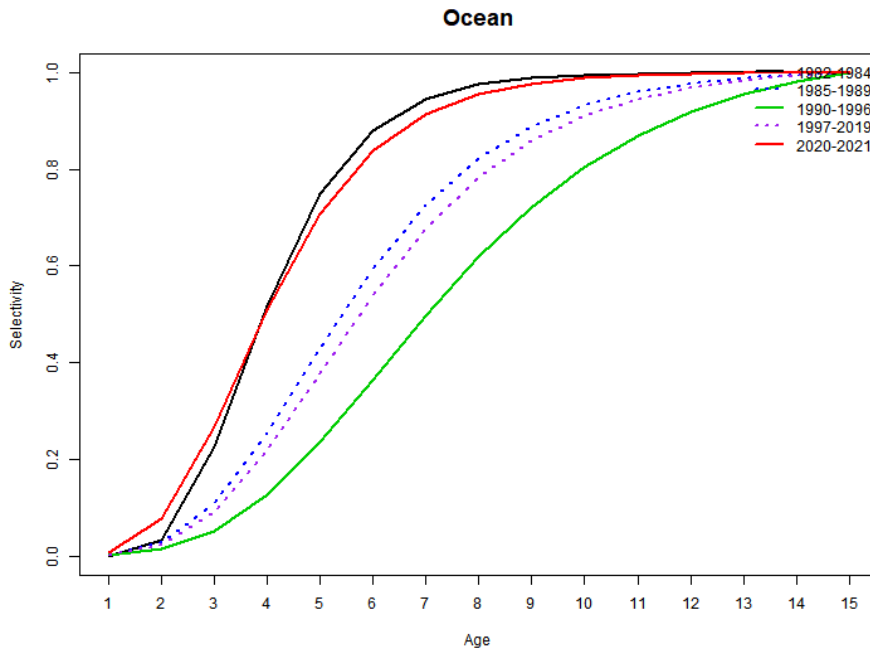
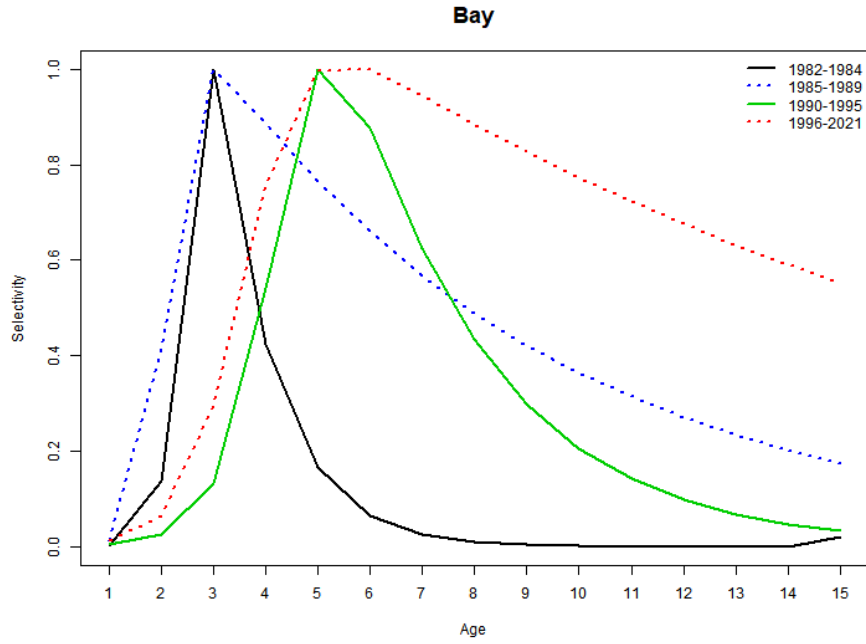


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CHESMAP Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)



Draft for Board Review

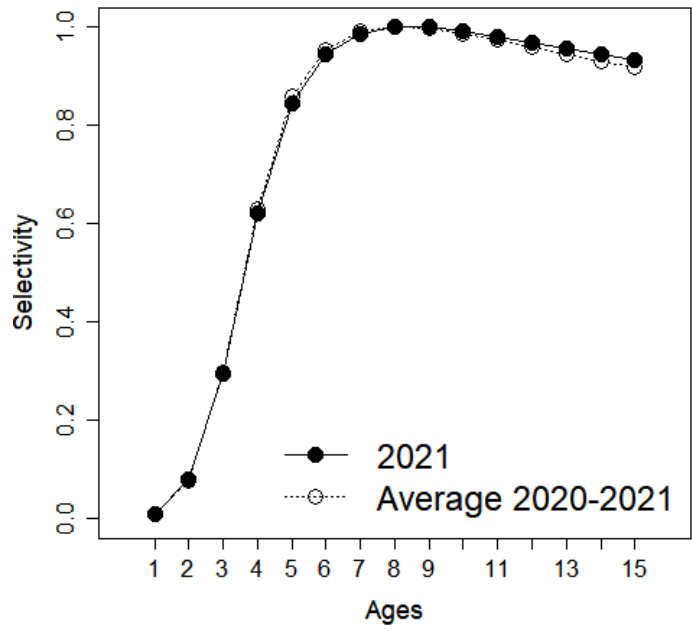


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	Likelihood Weight	RSS
Fleet 1 Total Catch:	2	0.203941
Fleet 2 Total Catch:	2	1.64944
Aggregate Abundance Indices		
NYYOY	1	27.9845
NJYOY	1	30.2953
MDYOY	1	10.3757
Compos		
NYAge1	1	37.8359
MDAge1	1	32.1299
MDAge1	1	24.3735
Age Comp Abundance Indices		
NYOHS	1	18.844
NJTRAWL	1	20.5861
MDSSN	1	31.1651
DESSN	1	21.9651
MRIP	1	36.0729
CTLIST	1	27.1042
DE30FT	1	17.2646
ChesMap	1	14.7549
Total RSS		352.605
No. of Obs		517
Conc. Likel.		-98.9265
Age Composition Data Likelihood		
Fleet 1 Age Comp:	1	4757.8
Fleet 2 Age Comp:	1	7441.8
NYOHS	1	735.133
NJTRAWL	1	309.569
MDSSN	1	1099.63
DESSN	1	1011.45
MRIP	1	2604.06
CTLIST	1	824.734
DE30FT	1	232.384
ChesMap	1	397.019
Recr Devs :	1	42.4776
Total Likelihood :		19287.9
AIC :		38951.7

Index	n	RMSE	CV Weight	Effective Sample
NYYOY	36	0.990473	2.97	
NJYOY	38	1.0041	1.75	
MDYOY	12	1.00956	2.14	
compos	40	0.996992	0.98	
NYAge1	37	0.99948	1.19	
MDAge1	52	0.998066	3.25	
NYOHS	20	0.997169	2.65	22.09
NJTRAWL	29	1.00089	2.95	5.68
MDSSN	37	0.998892	2.5	14.53
DESSN	24	1.00292	1.17	18.3
MRIP	40	1.00968	2.28	30.43
CTLIST	34	0.996532	3	13.07
DE30FT	21	1.00038	0.85	5.88
ChesMP	17	1.00036	2.45	15.06

Ocean Only Selectivities for Projections

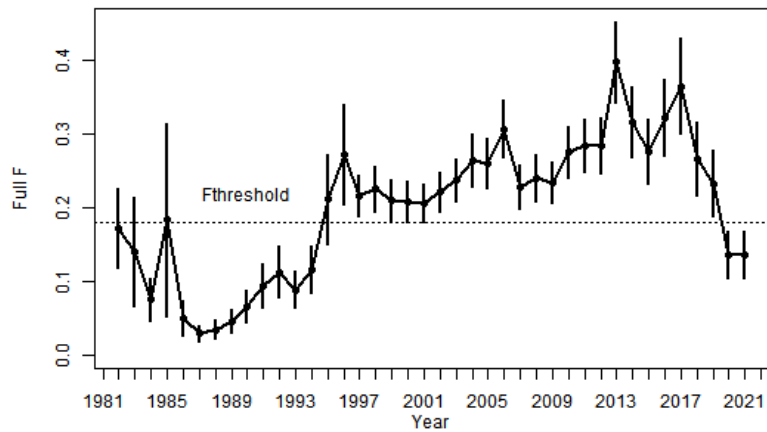


Draft for Board Review

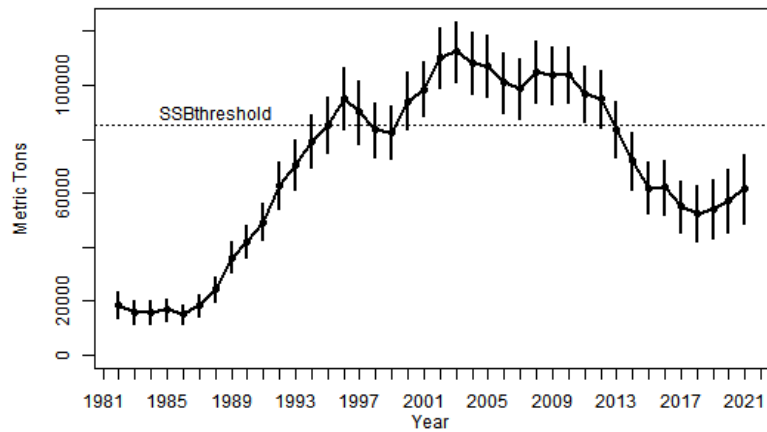
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SSBtarget=106667; Ftarget=0.1495
Fcurrent=0.1355

Estimates with 95% Confidence Intervals

Fully-recruited Fishing Mortality

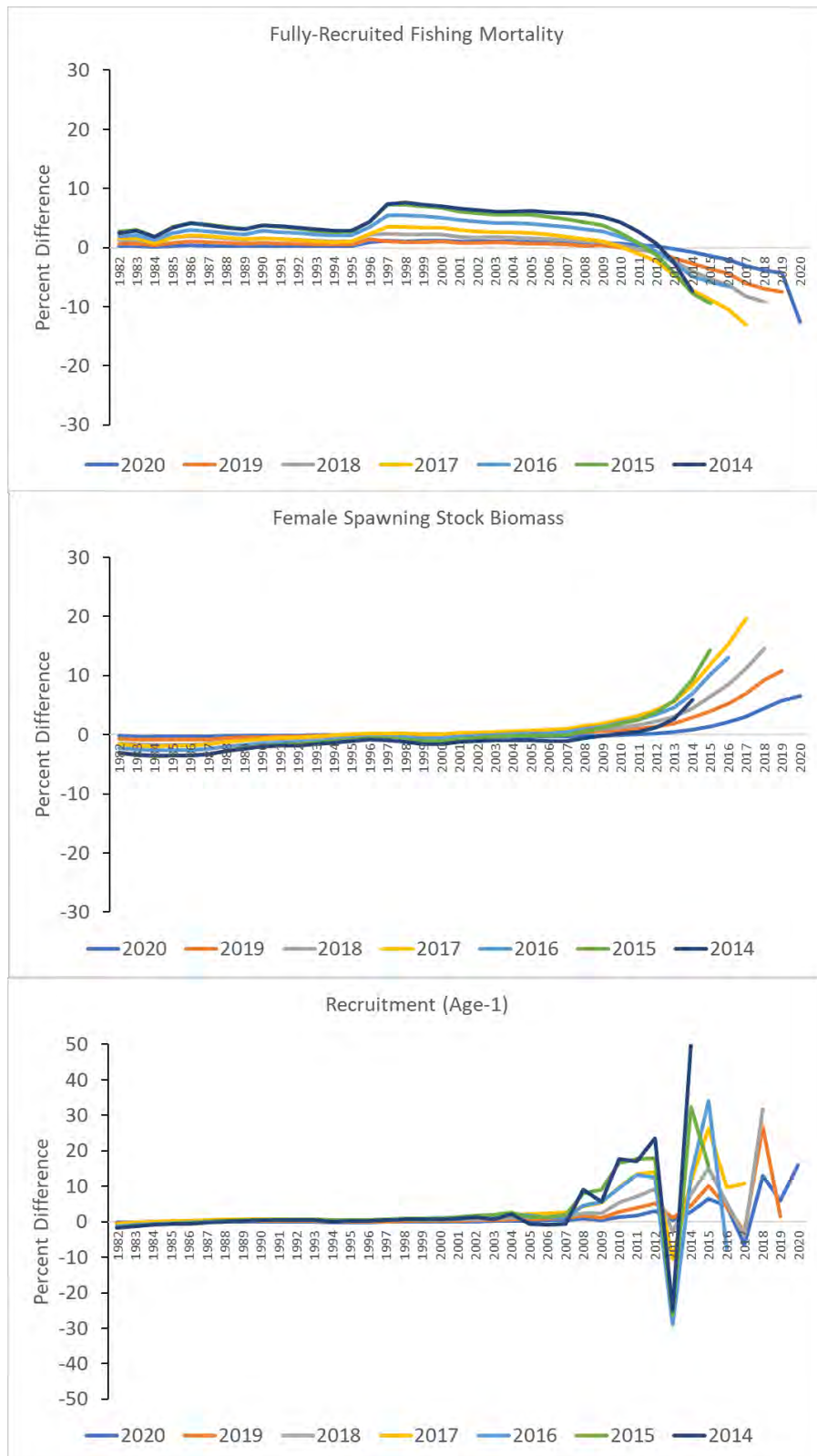


Female Spawning Stock Biomass



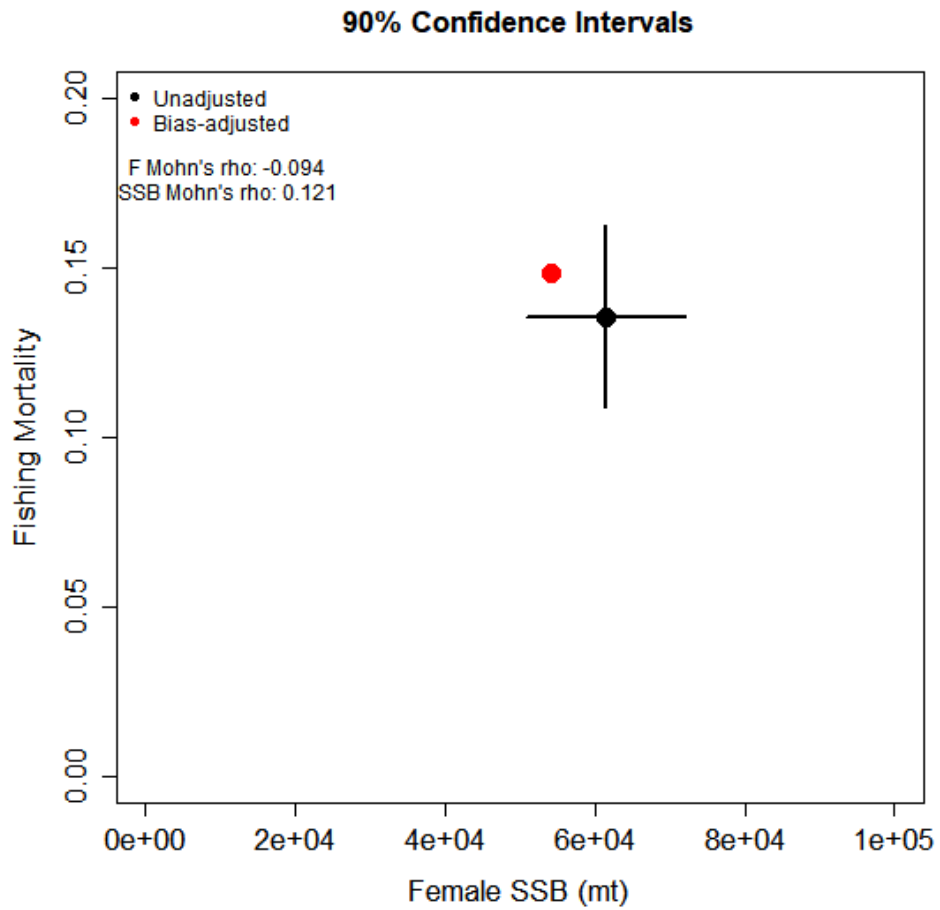
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Number of peels = 7 (NMFS standard)



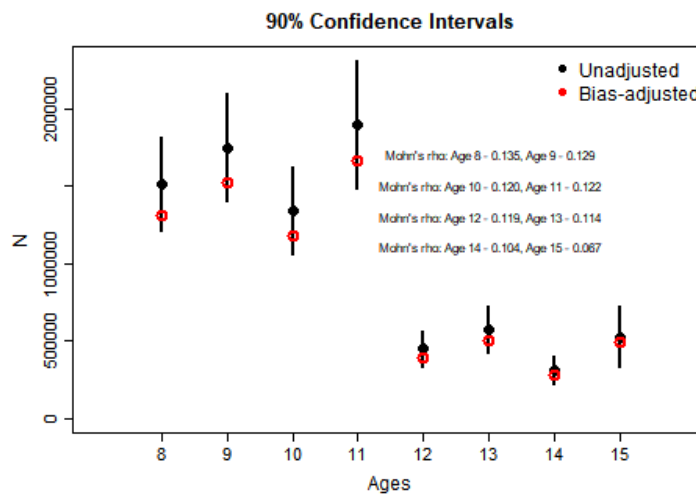
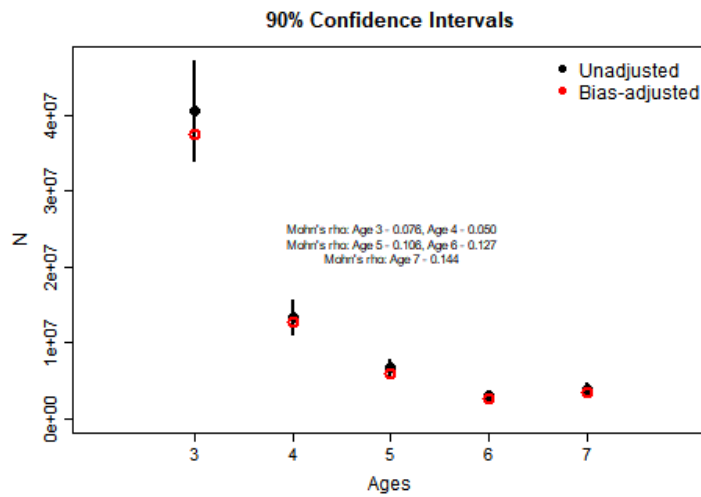
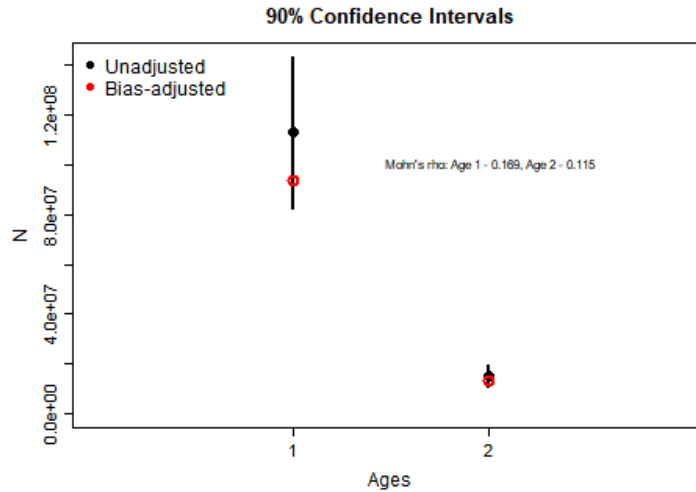
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Retrospective bias corrected values within 90% confidence intervals of original values, so bias-correction not required.



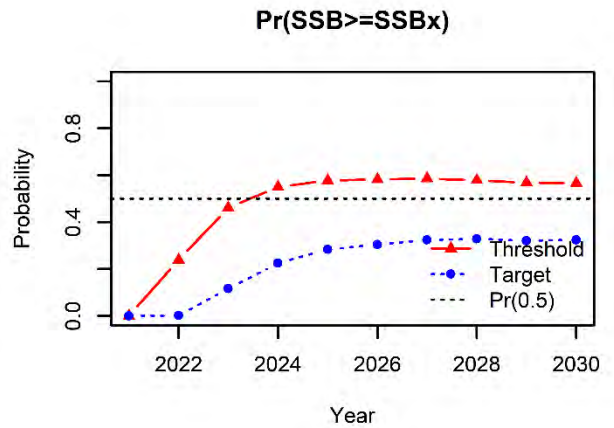
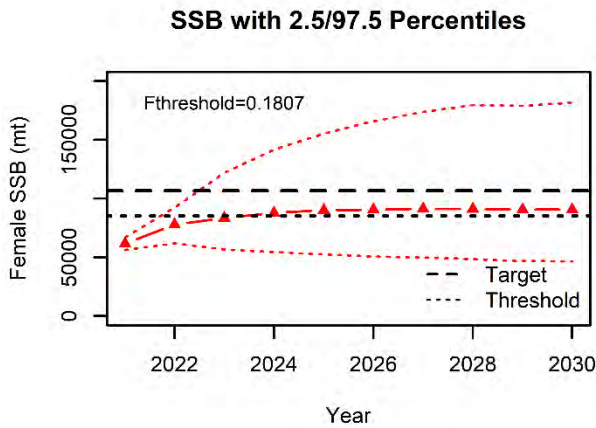
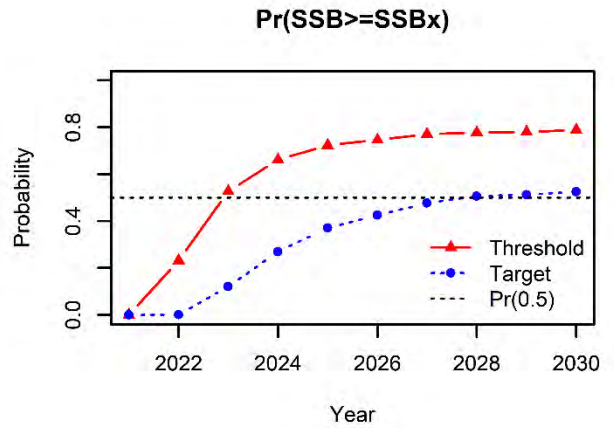
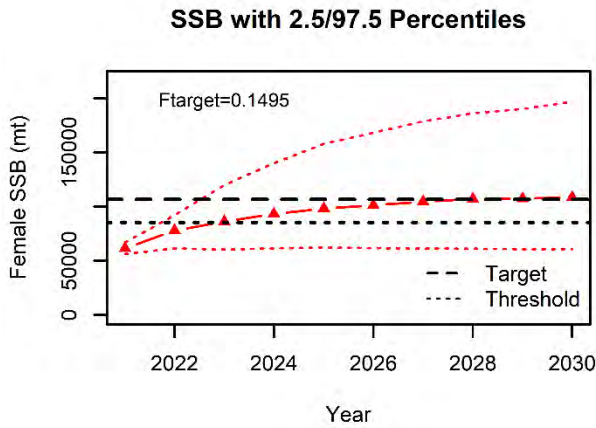
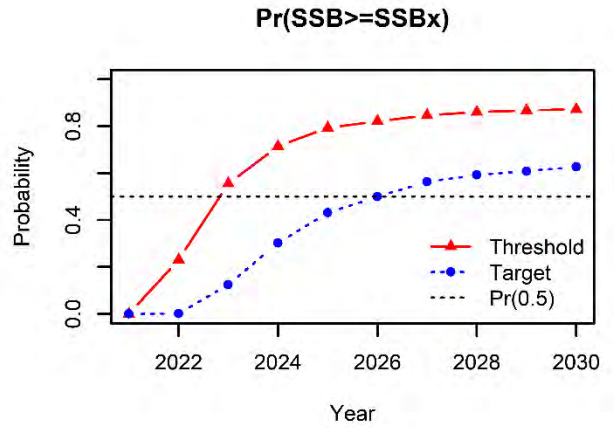
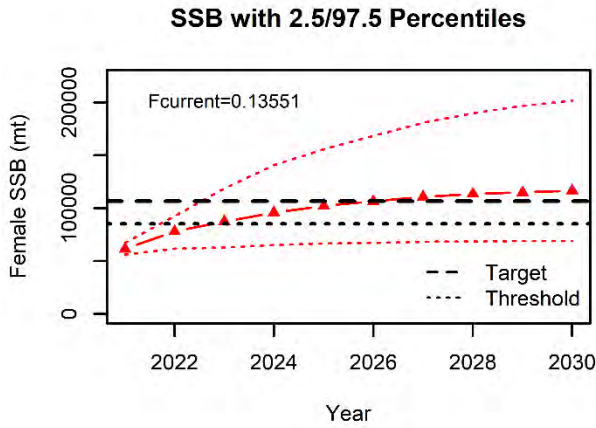
Draft for Board Review

Most retro corrected N values inside 90% CIs of original estimates – Bias-correction not required.



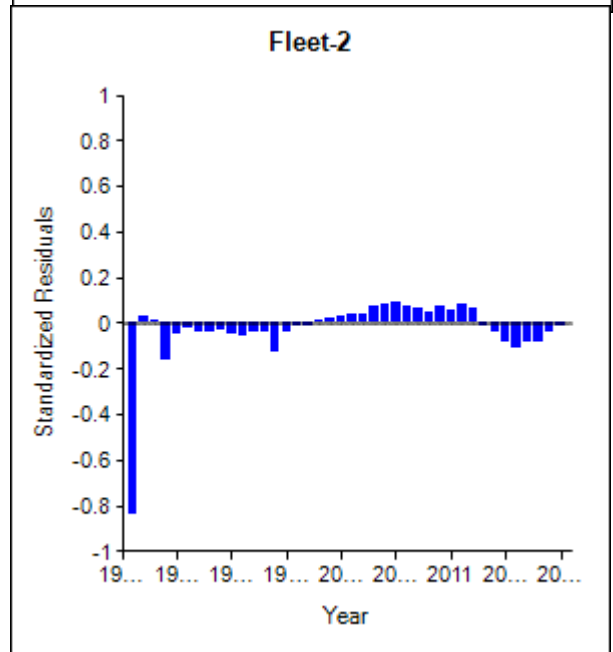
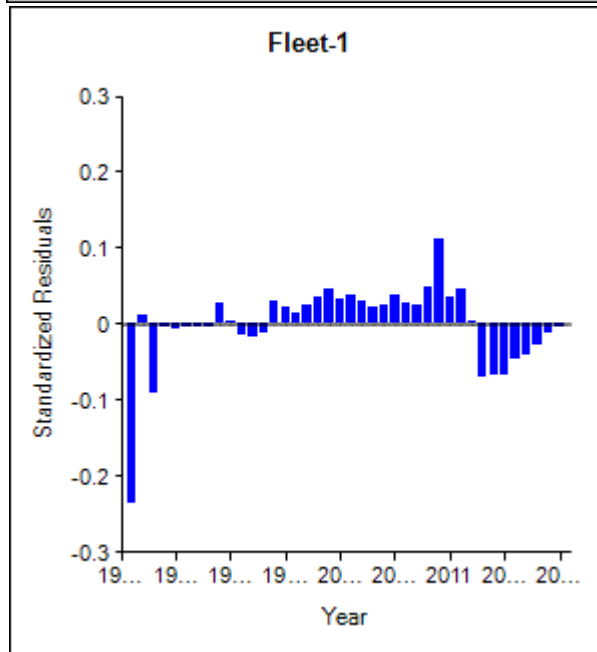
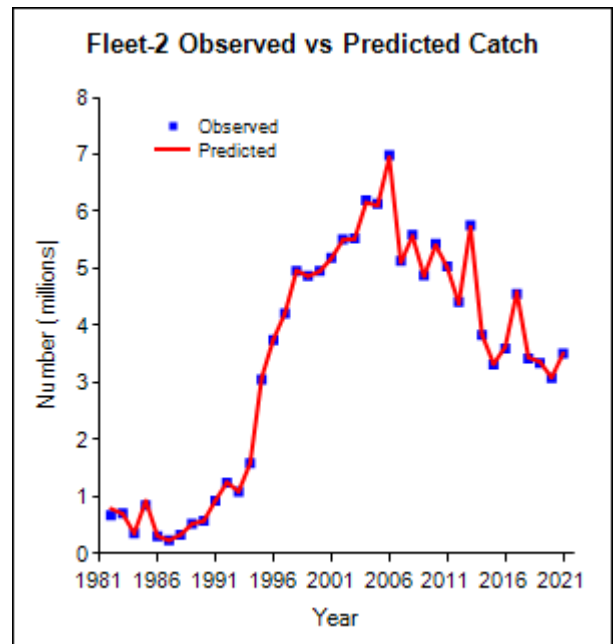
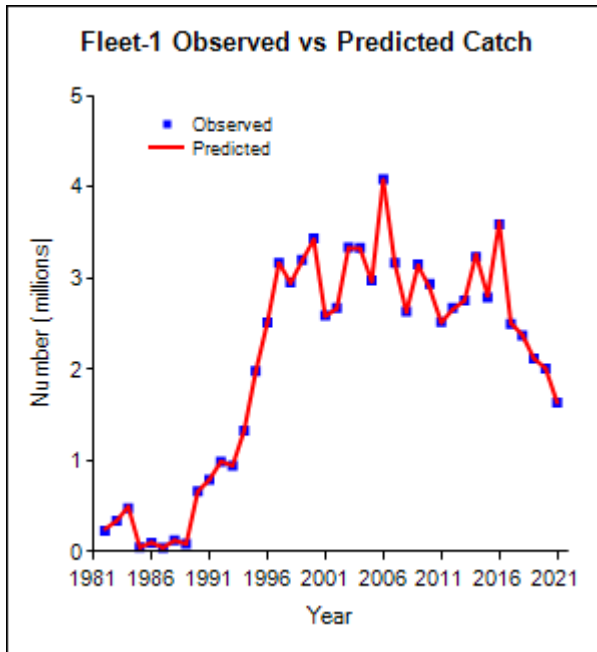
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using non-bias-corrected estimates of F and N-at-age
 SSBtarget reached by 2026 at current F and 2028 at target F



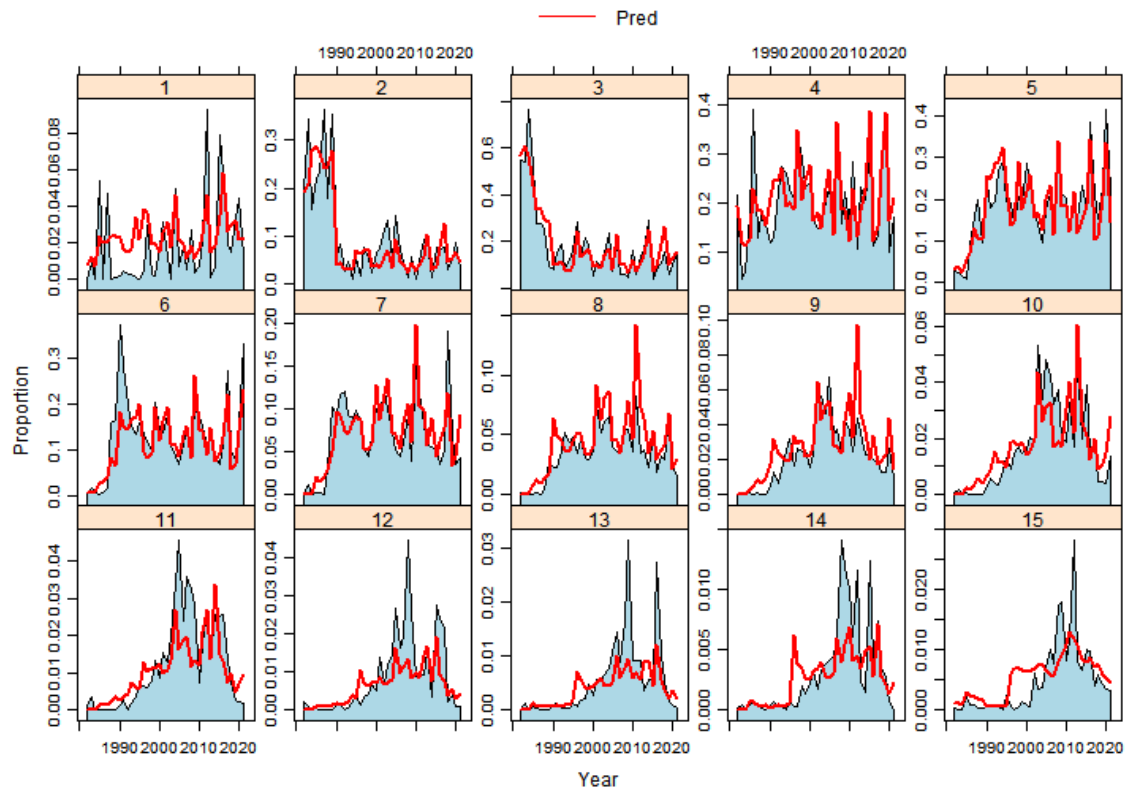
Appendix 4. Diagnostic plots and results from the SCA model with no new selectivity blocks added to the model.

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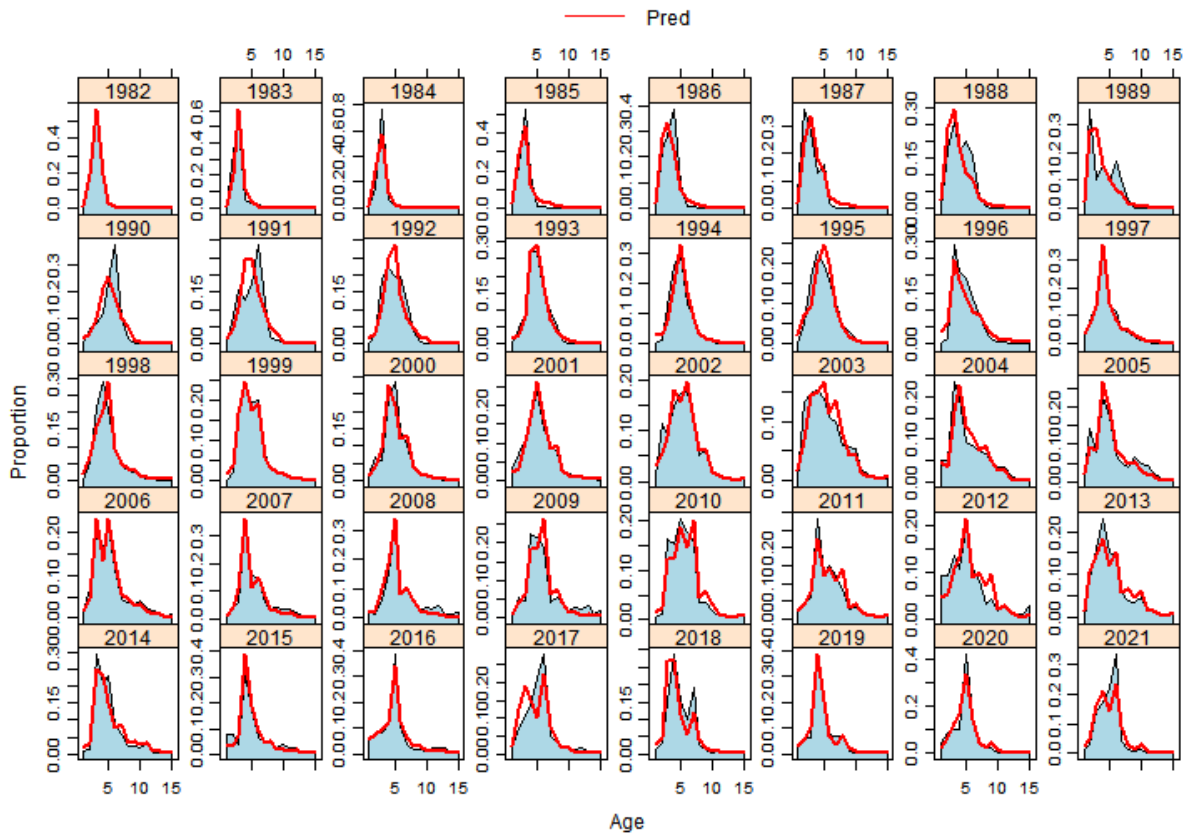


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Fleet 1 Catch Age Composition By Age

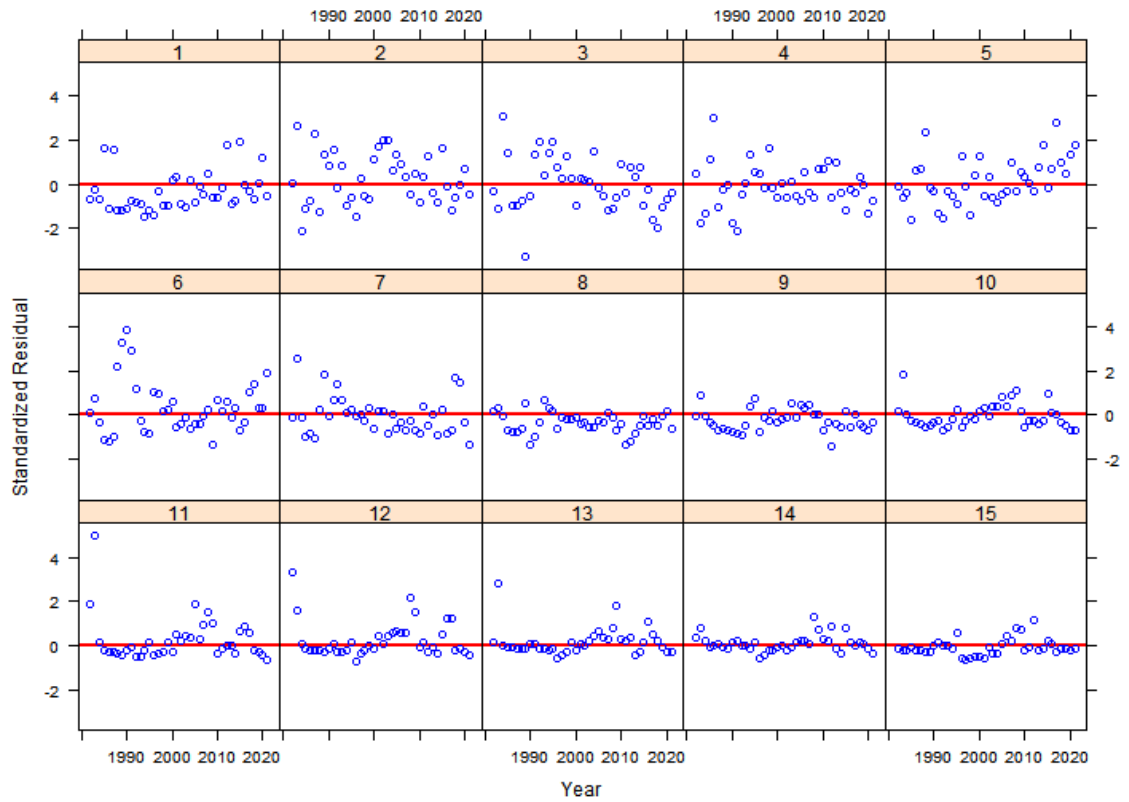


Fleet 1 Catch Age Composition By Year

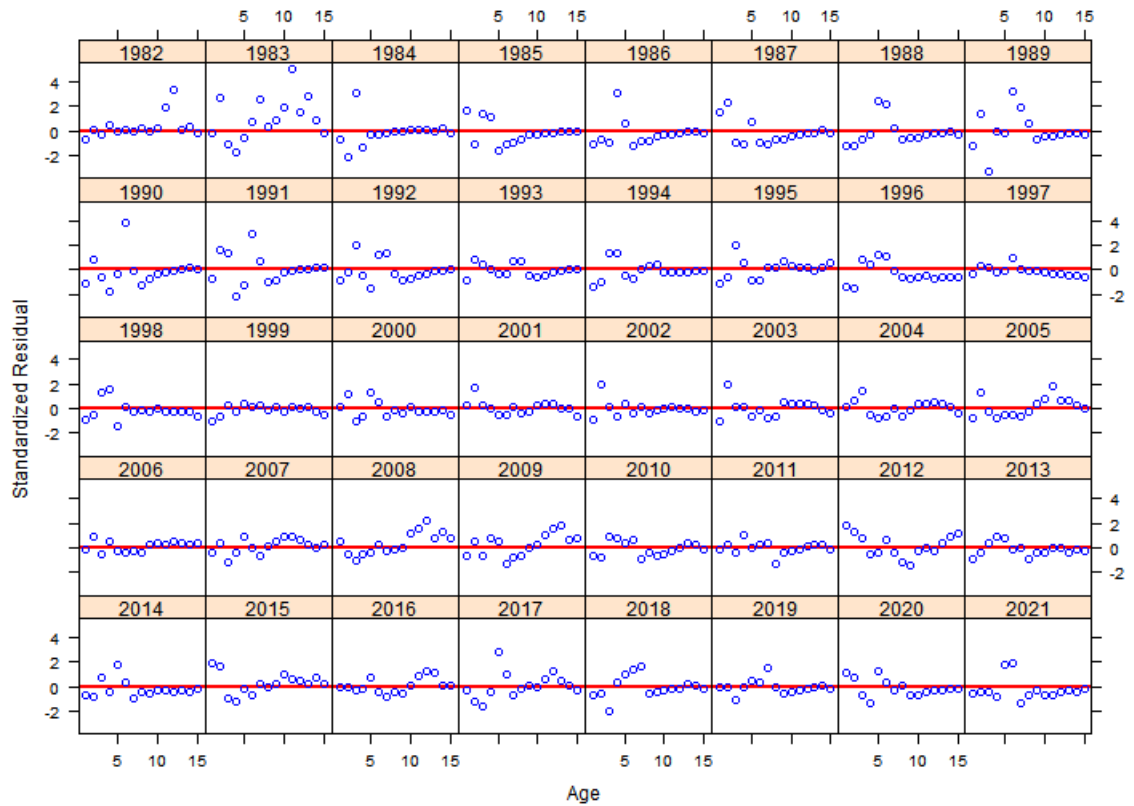


Draft for Board Review

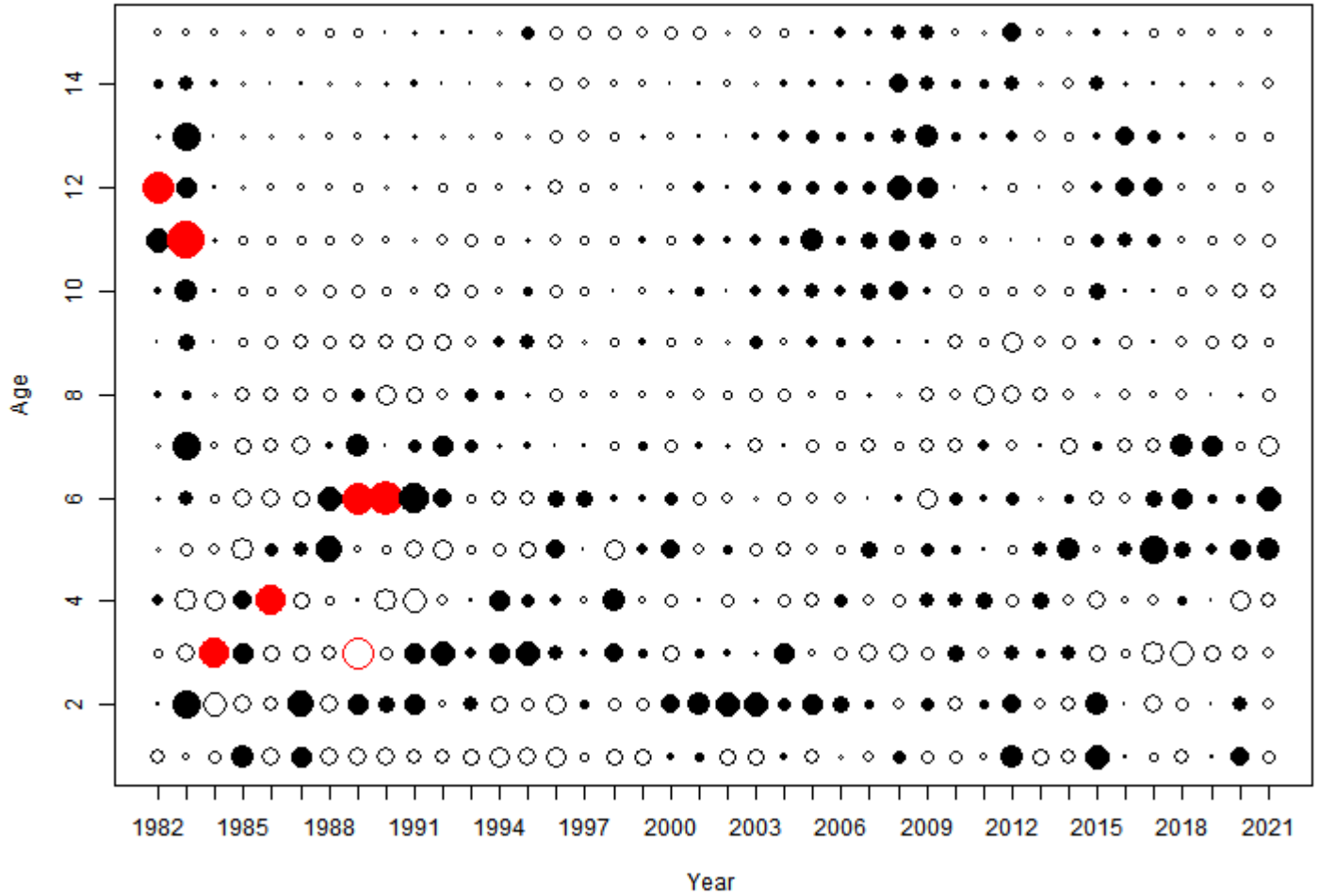
Fleet 1 Residuals of Age Composition By Age



Fleet 1 Residuals of Age Composition By Year

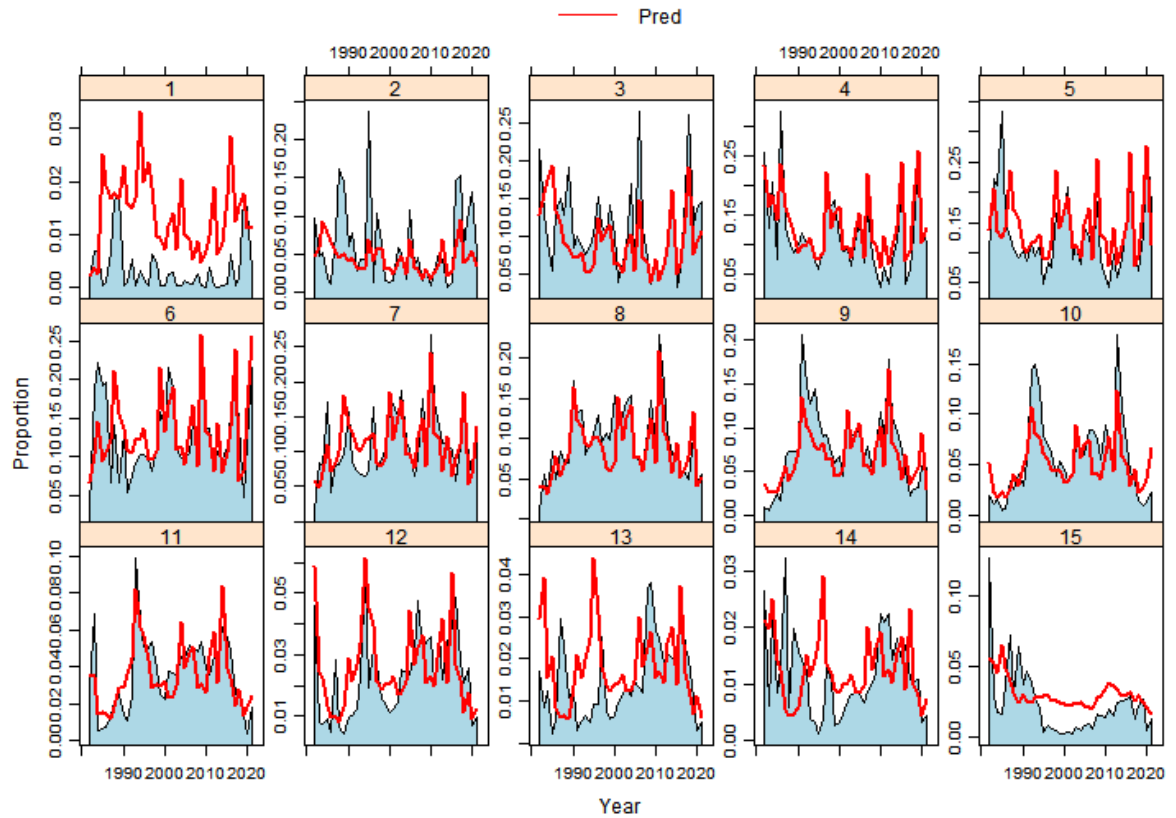


Fleet 1 Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)

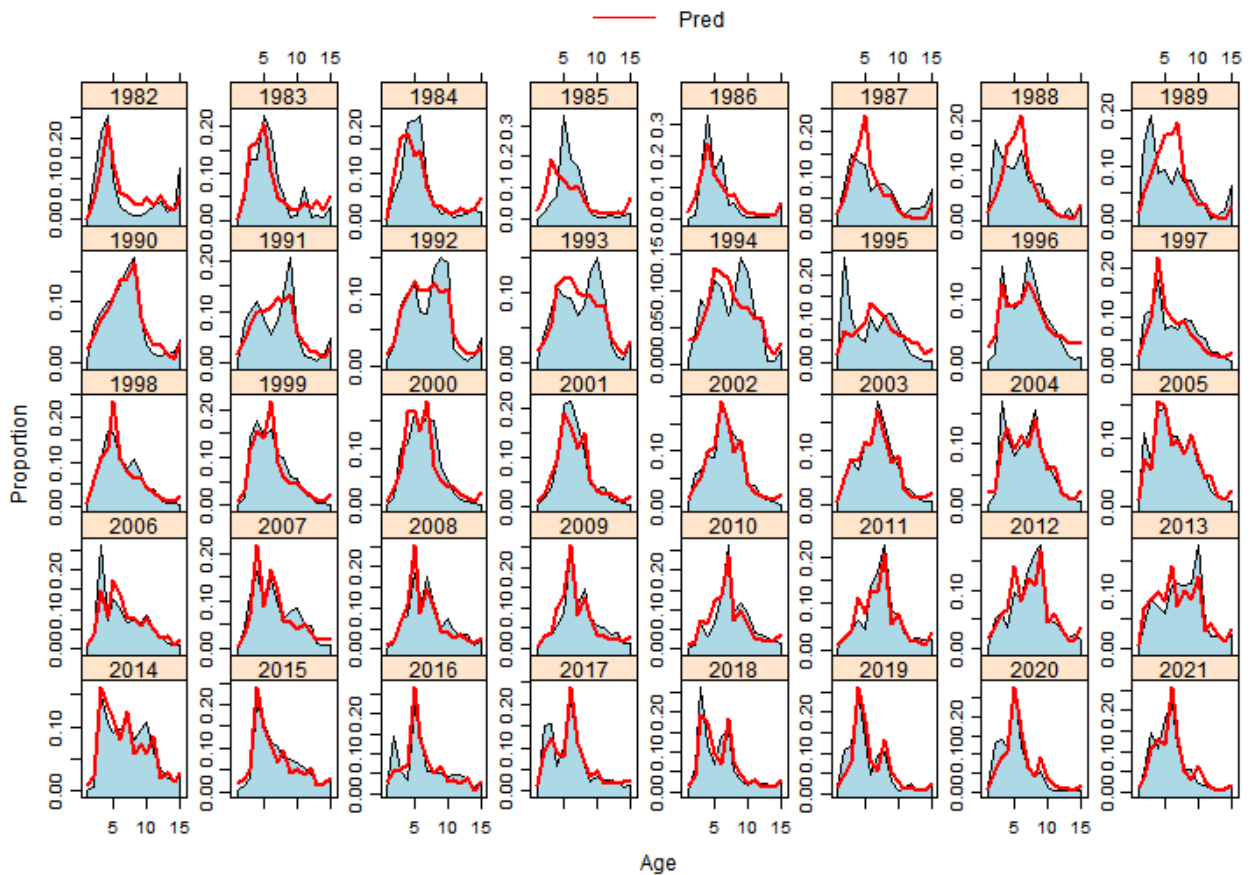


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Fleet 2 Catch Age Composition By Age

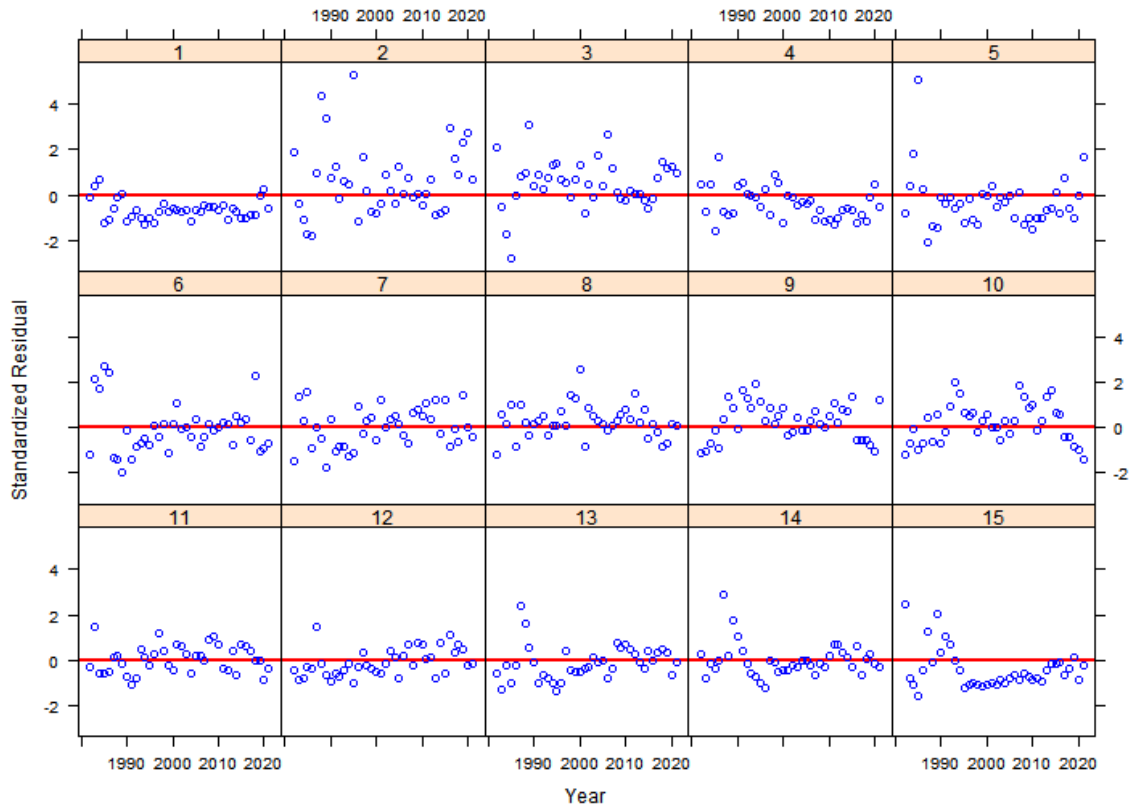


Fleet 2 Catch Age Composition By Year

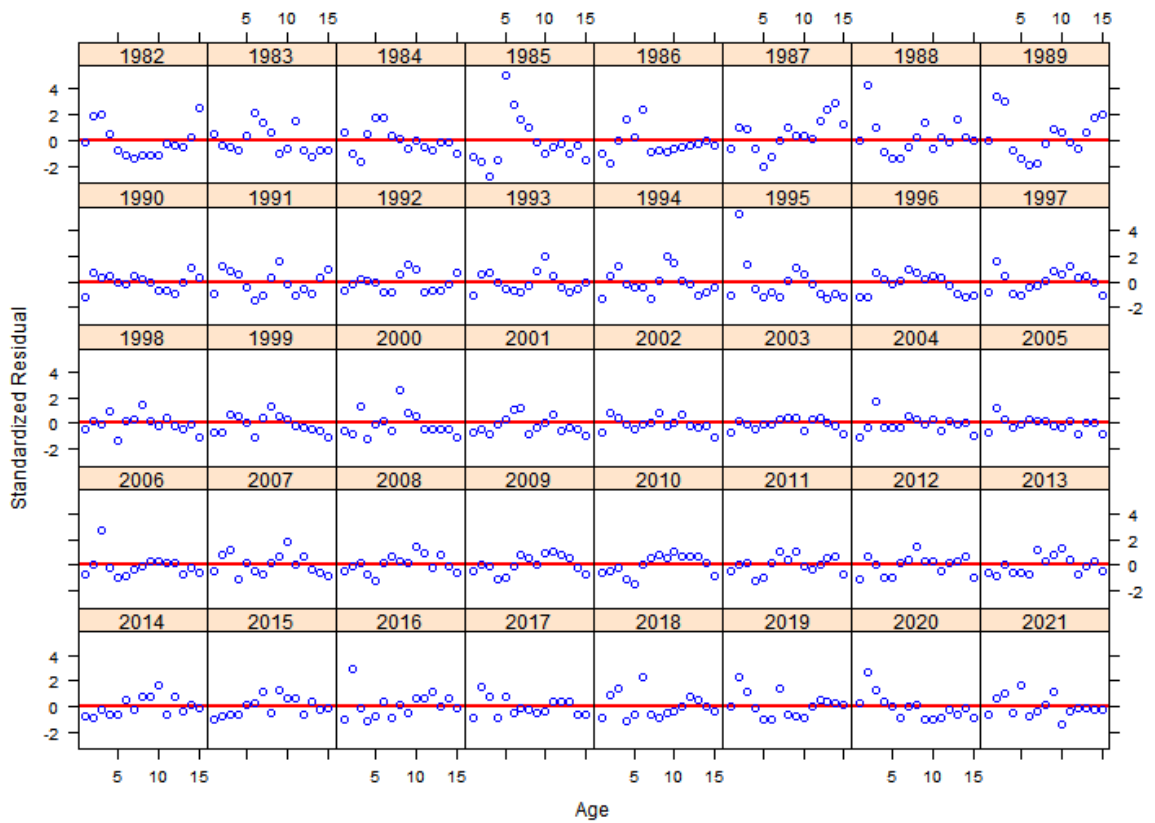


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Fleet 2 Residuals of Age Composition By Age

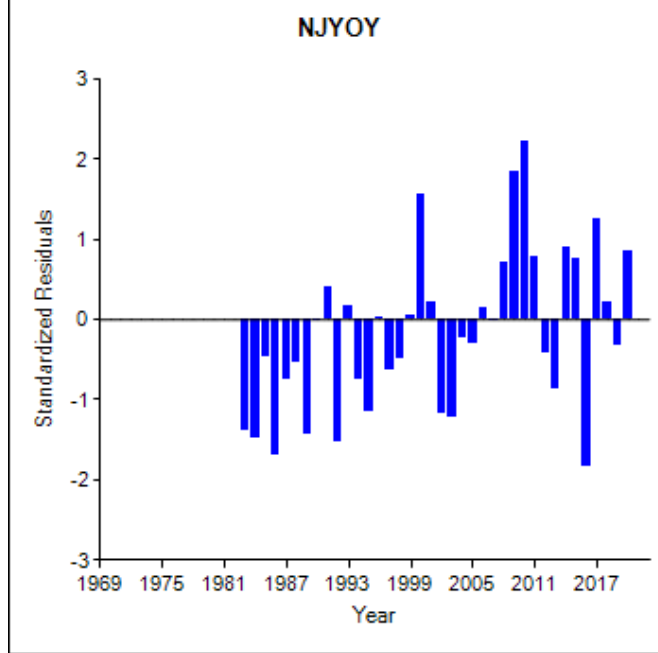
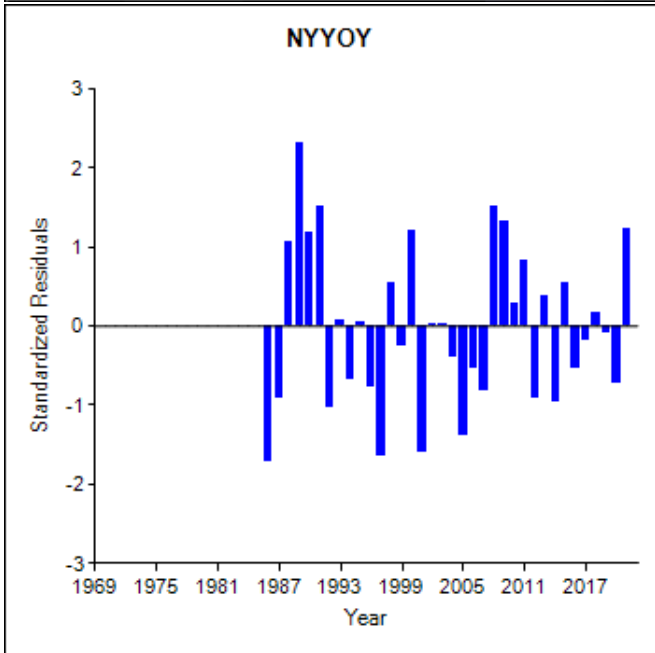
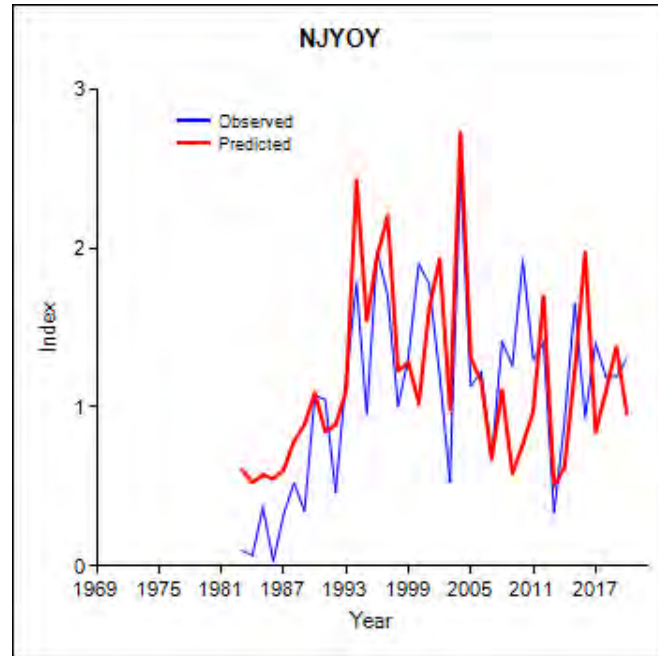
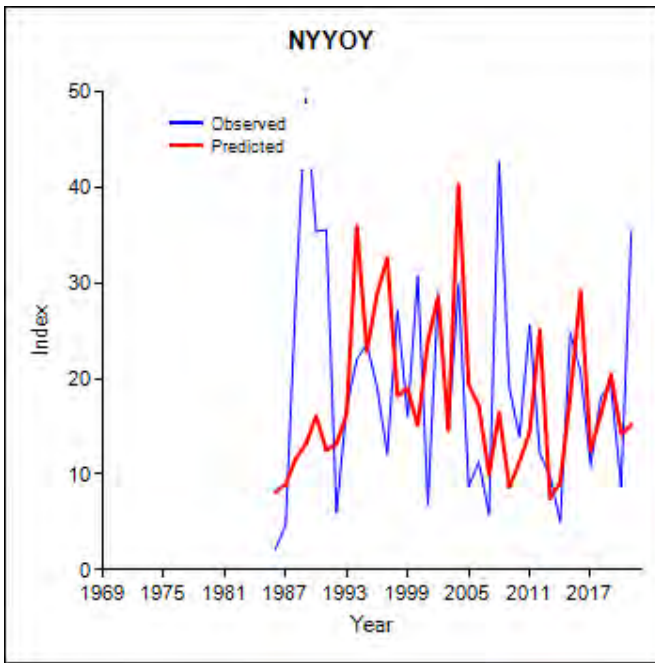


Fleet 2 Residuals of Age Composition By Year

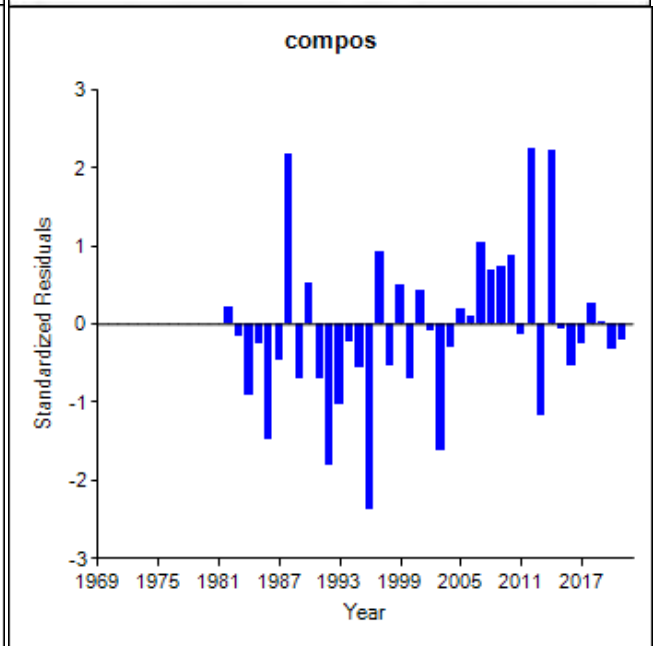
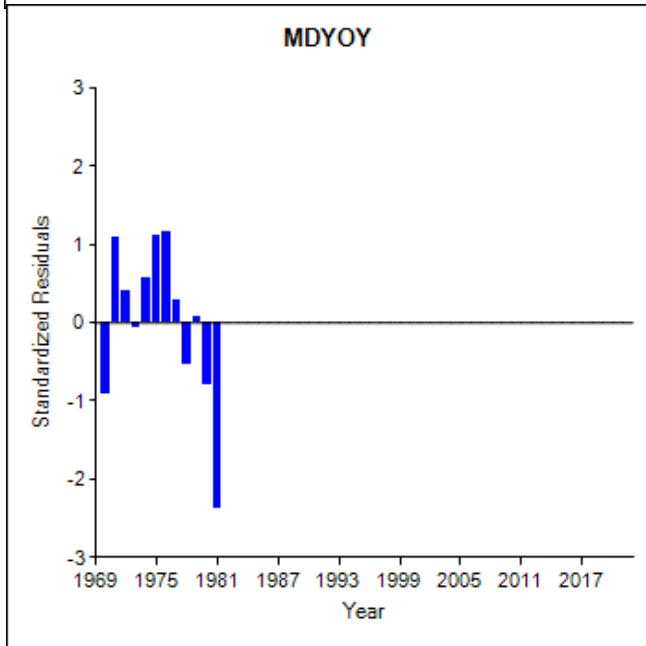
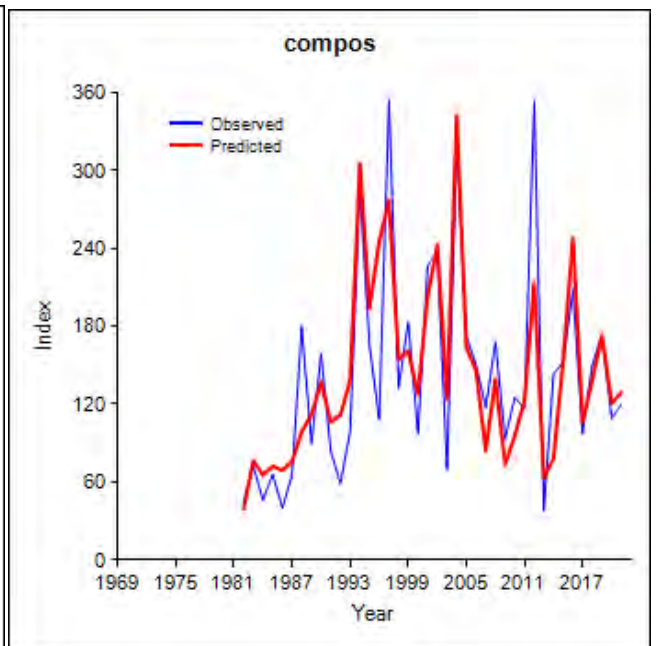
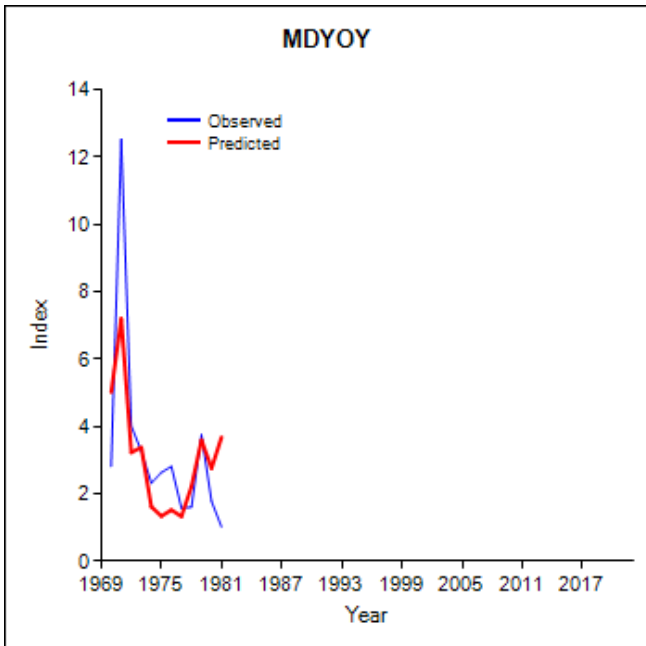


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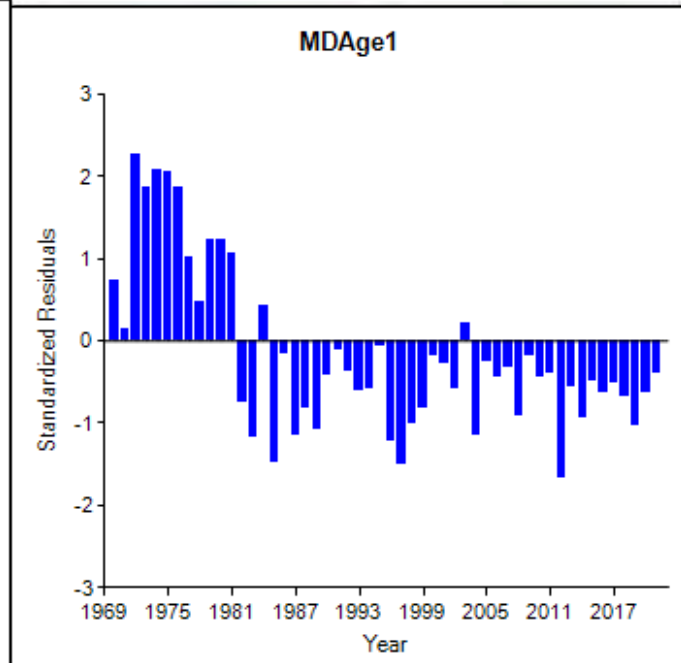
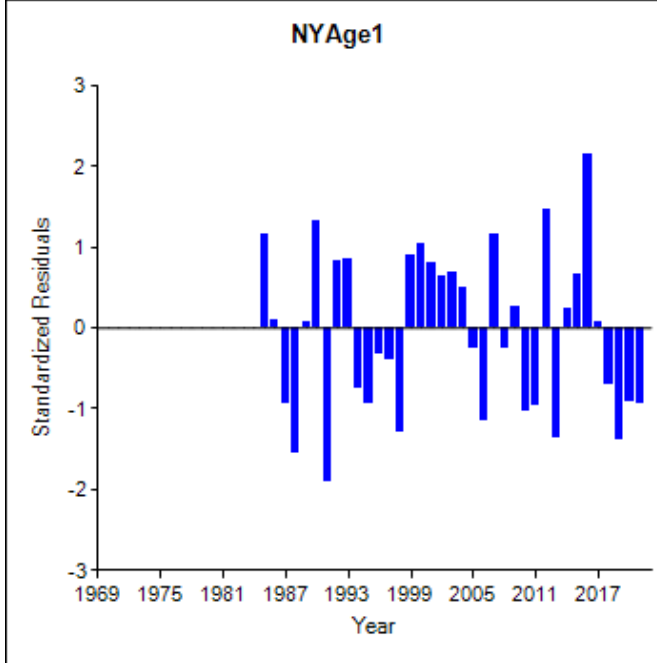
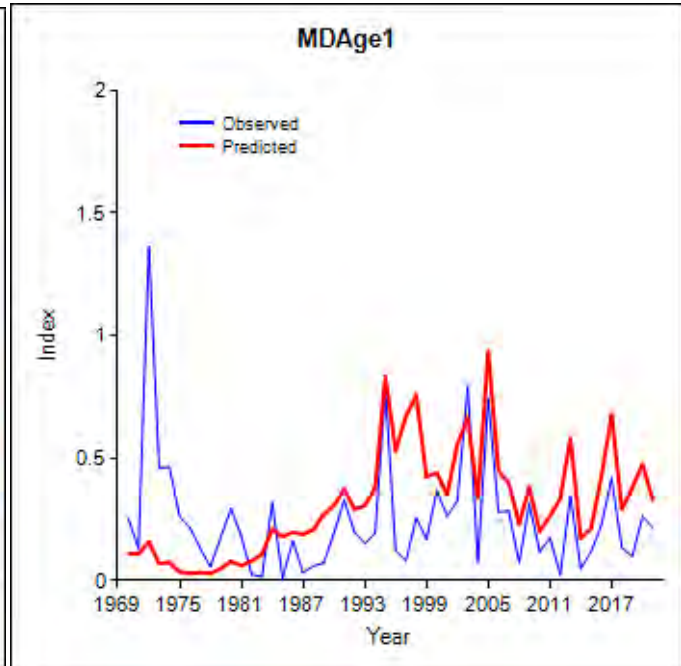
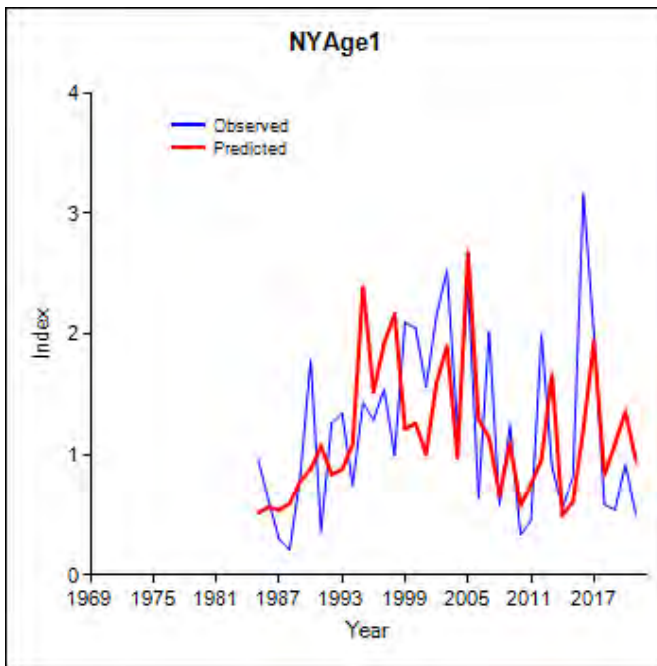
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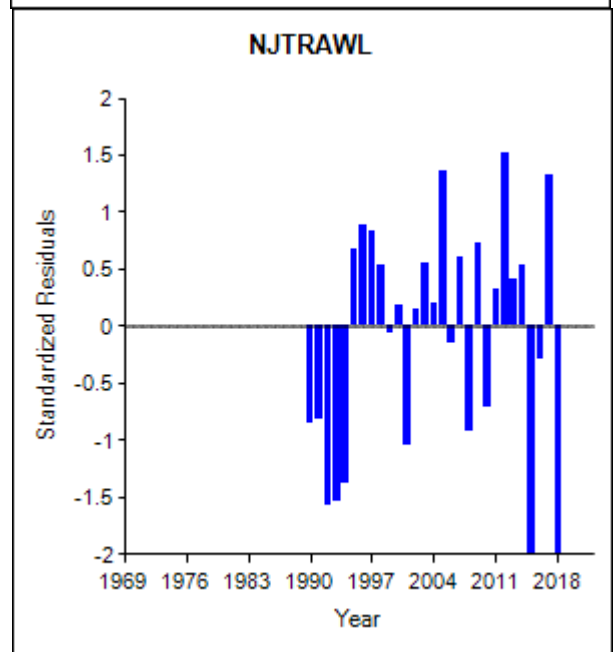
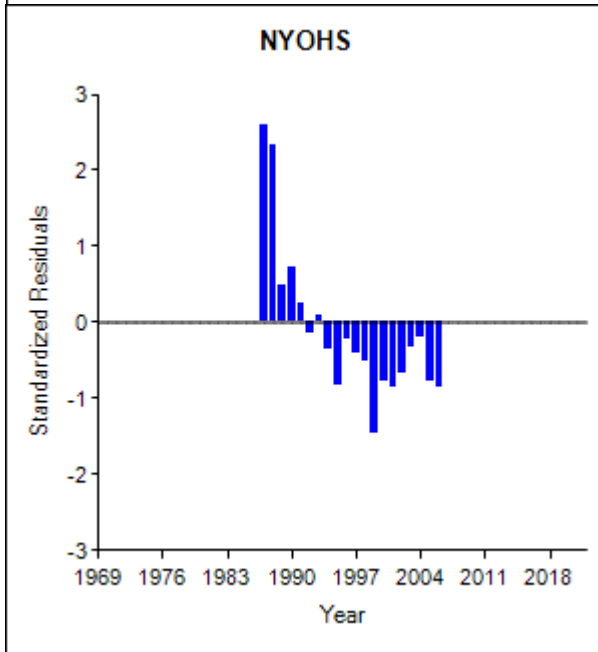
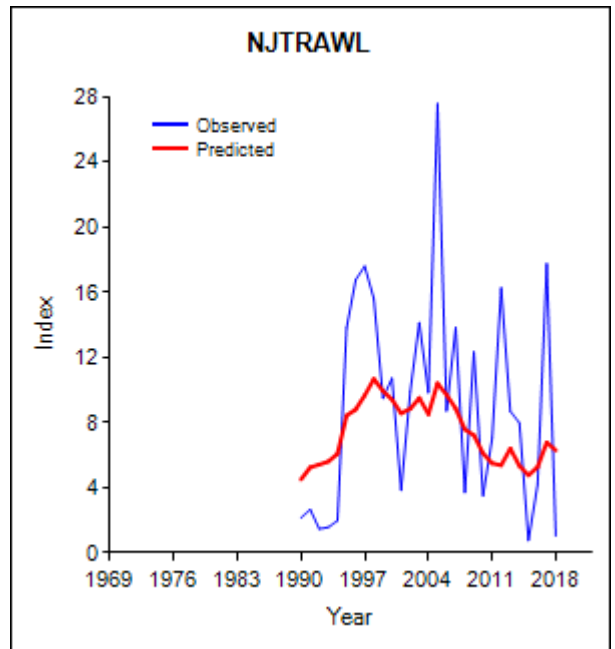
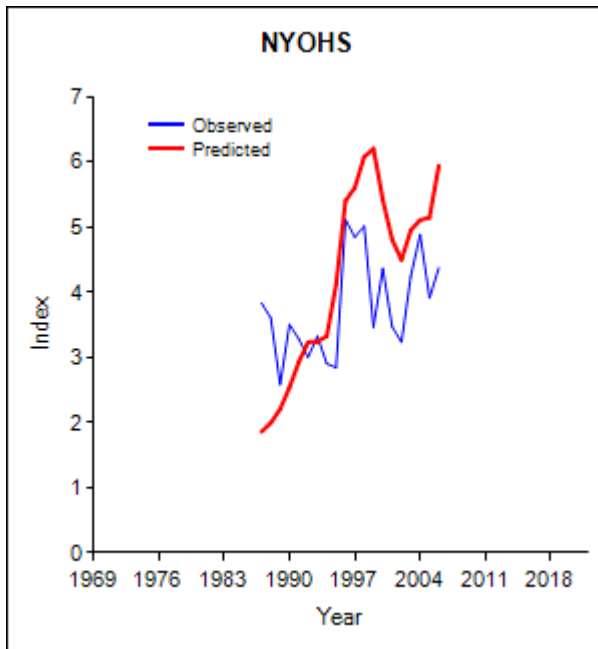
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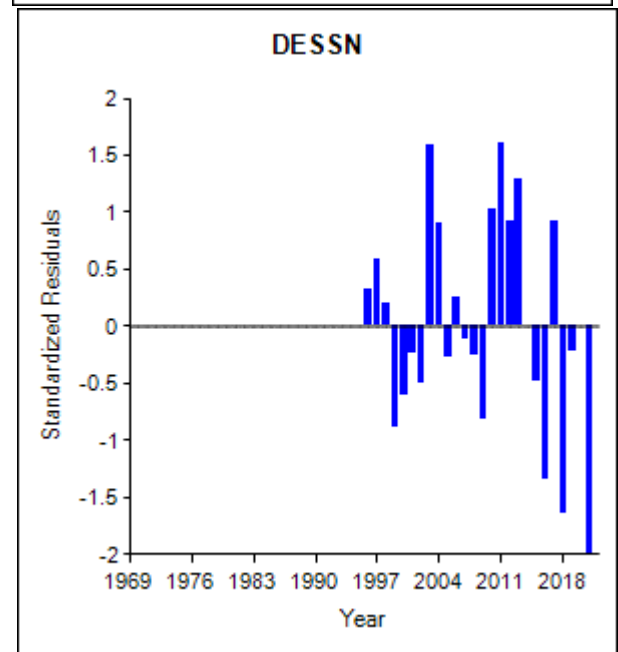
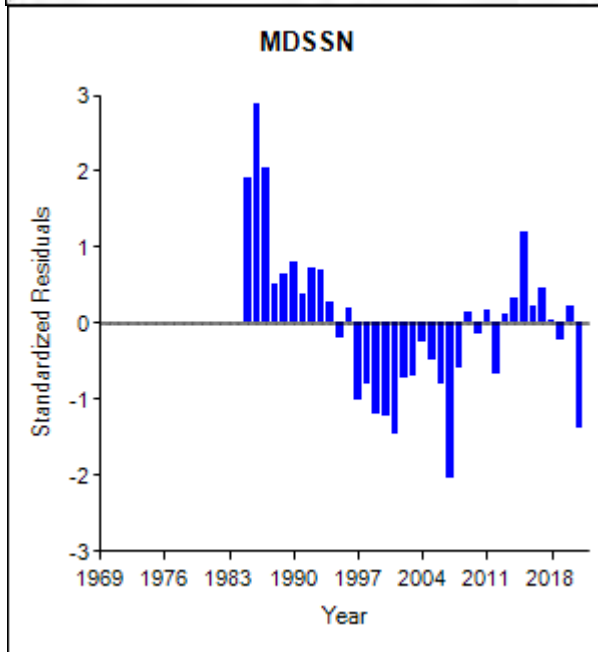
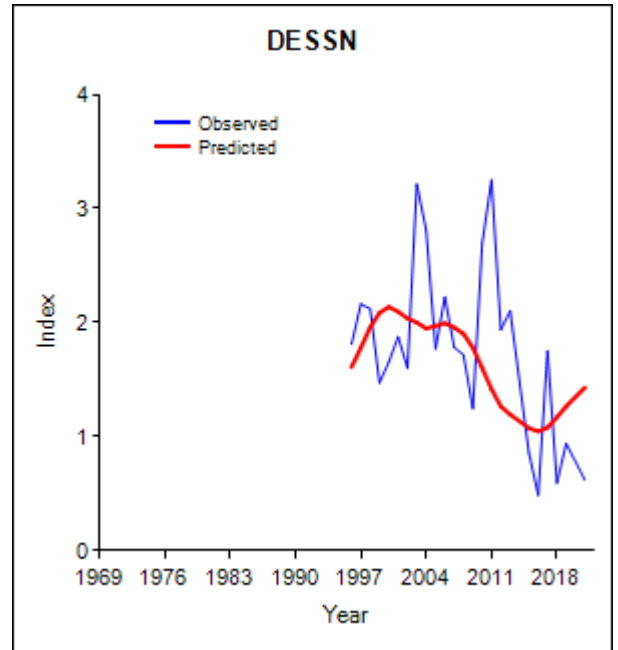
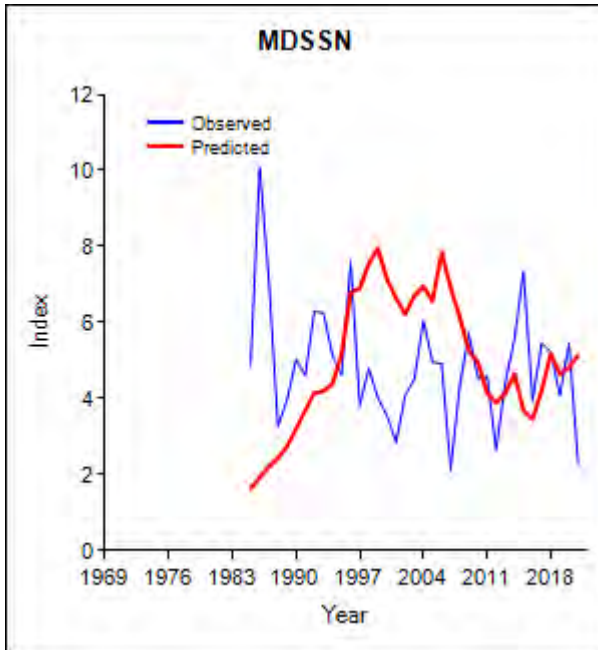
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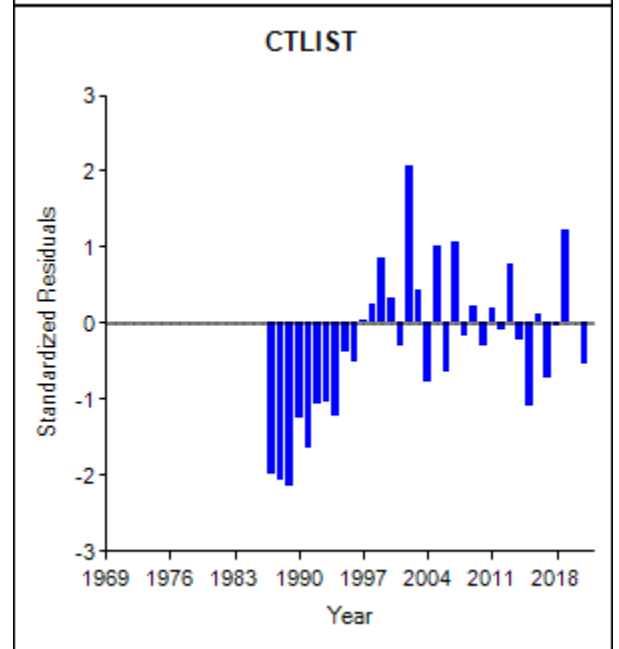
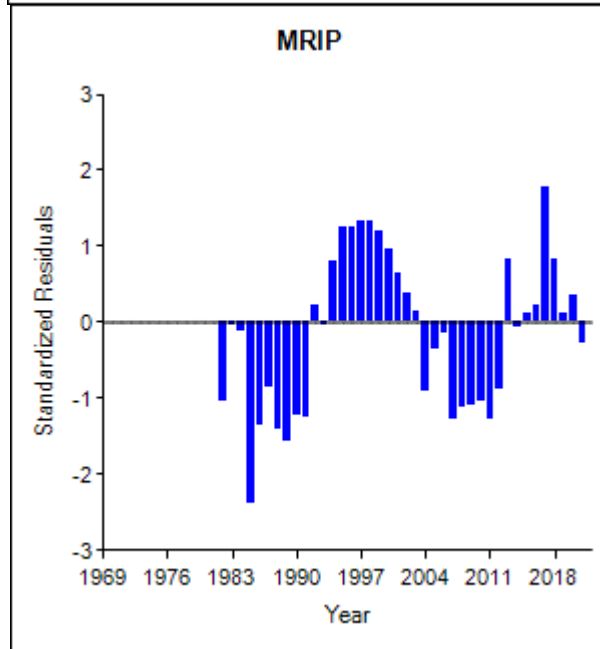
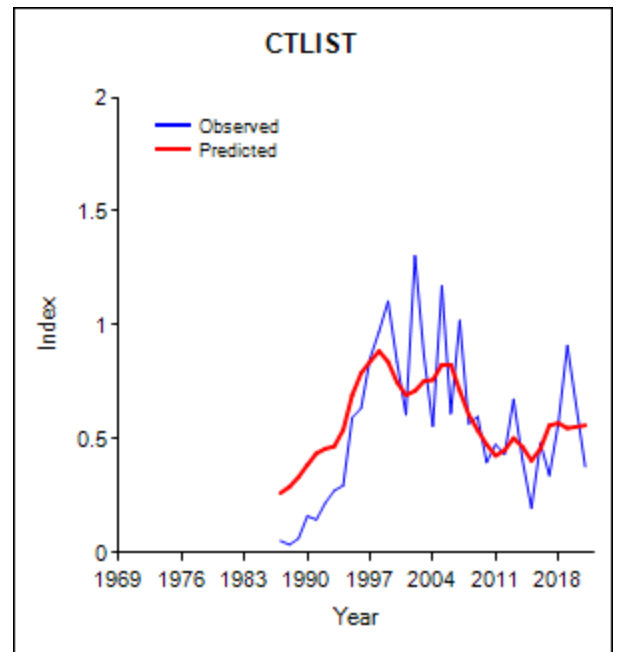
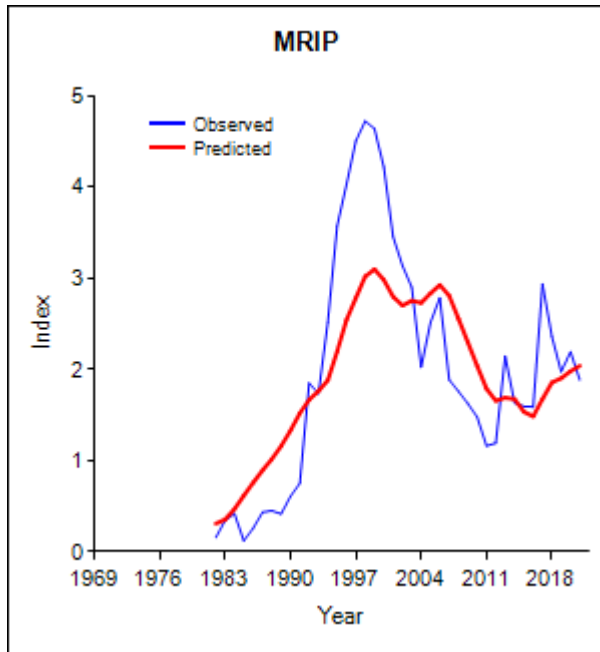
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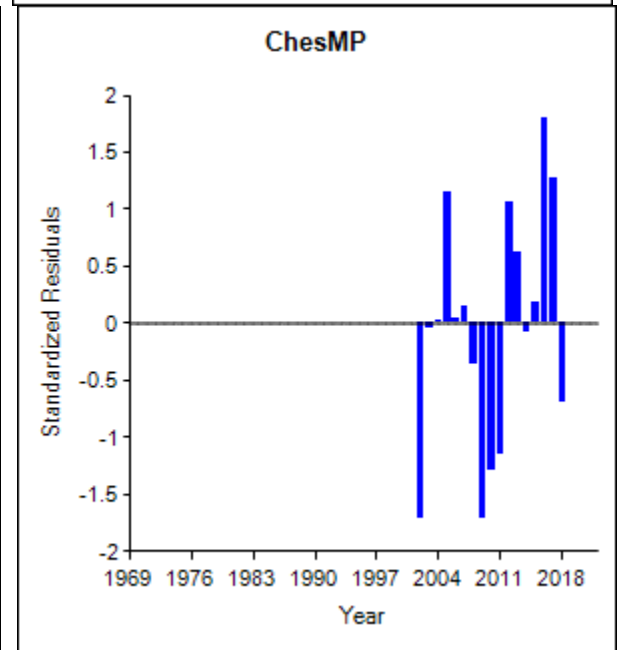
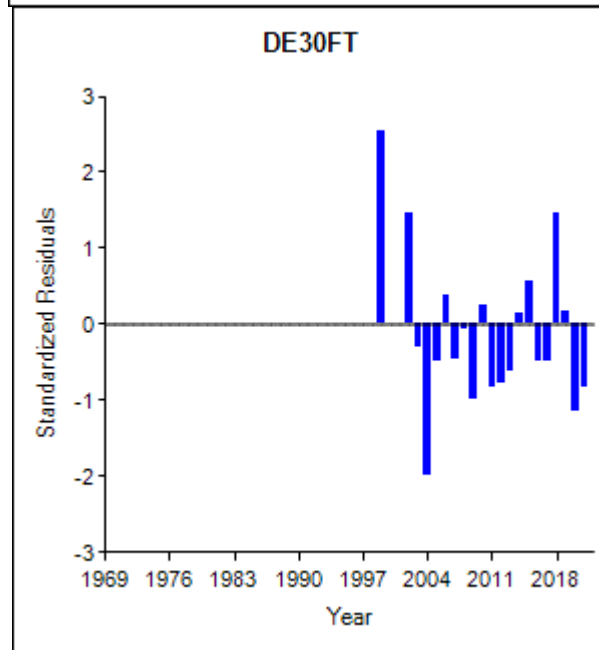
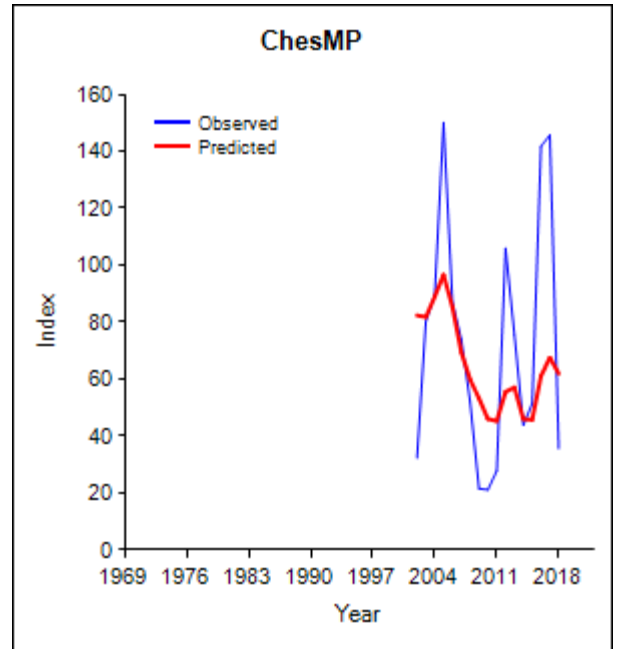
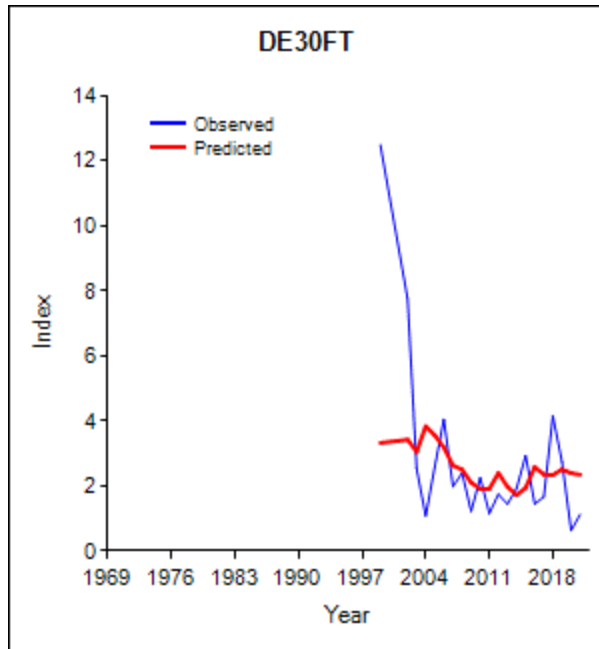
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Draft for Board Review

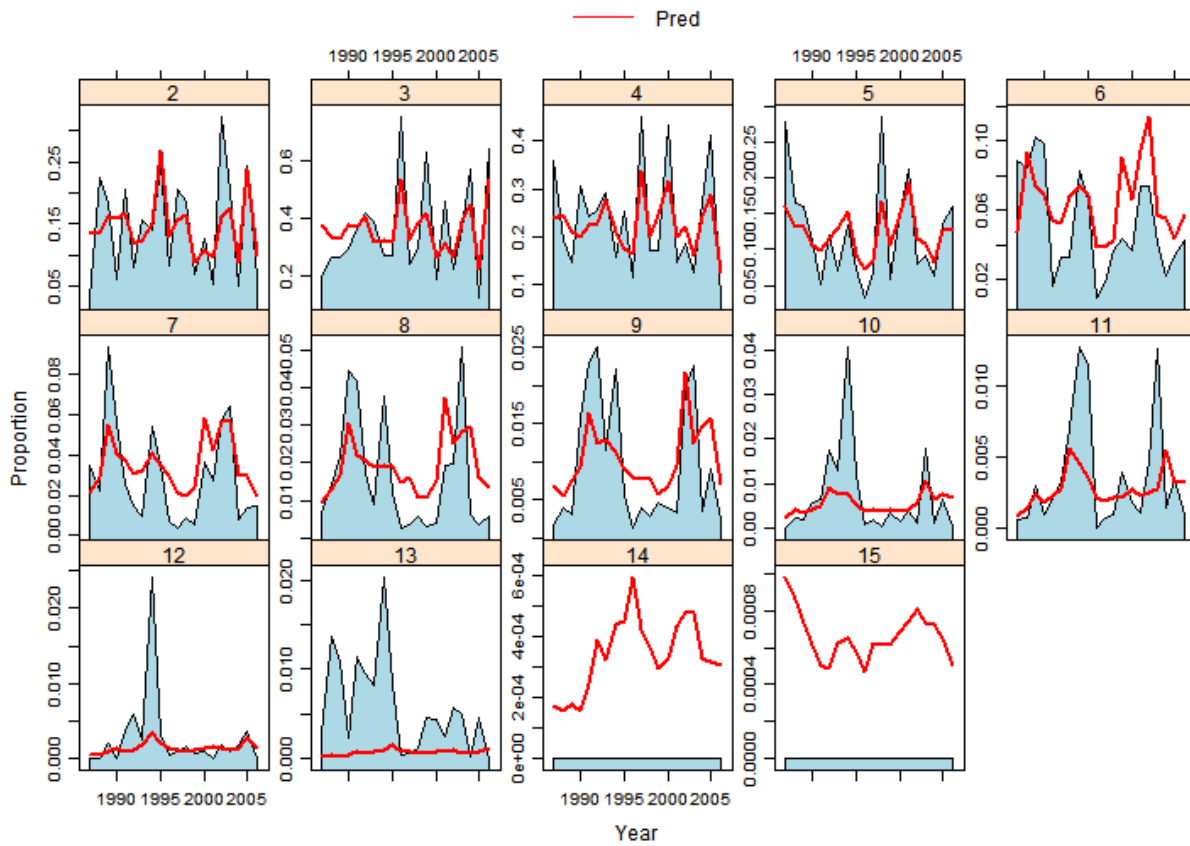


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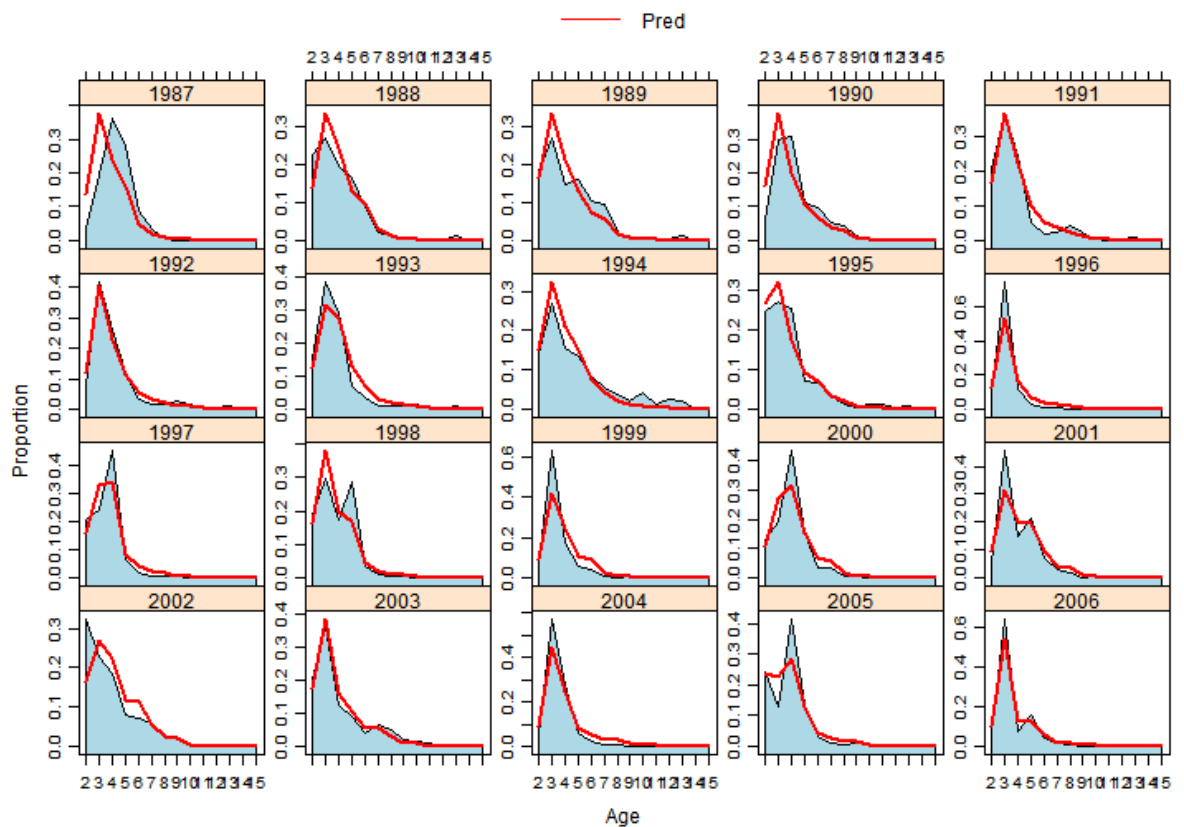


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NYOHS Age Composition By Age

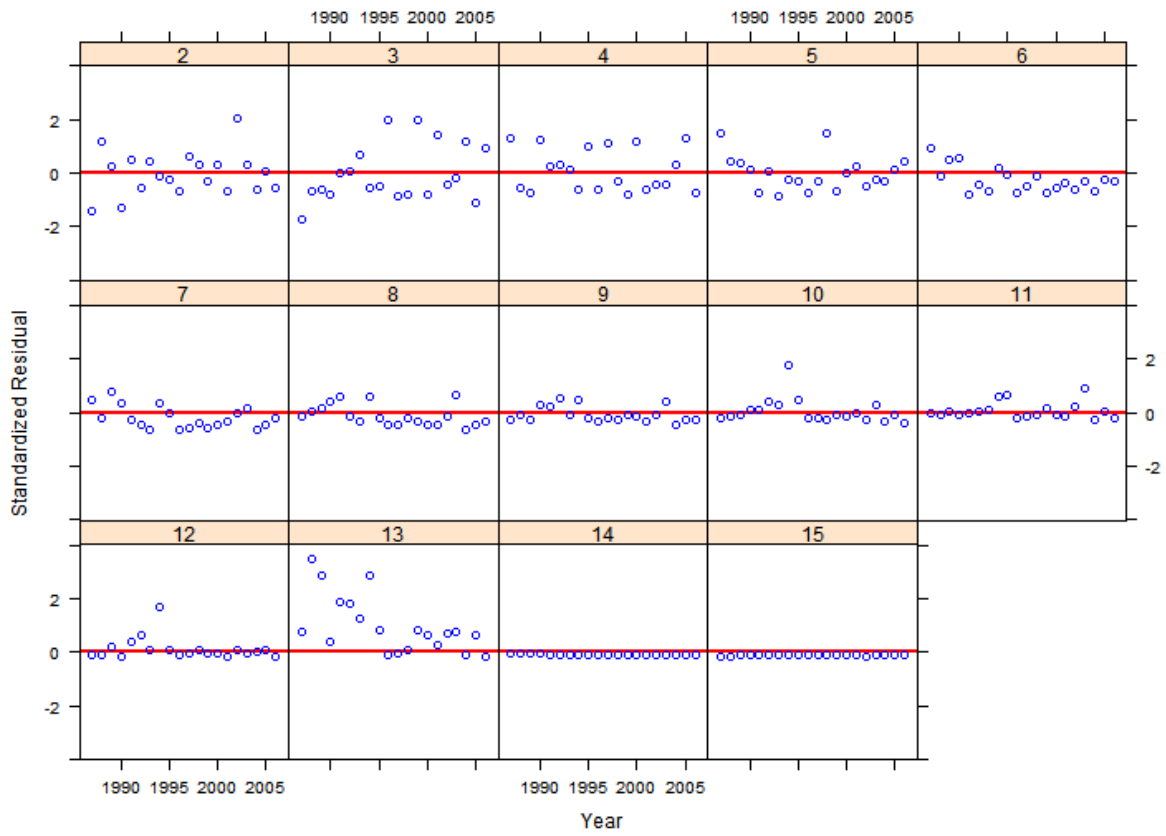


NYOHS Age Composition By Year

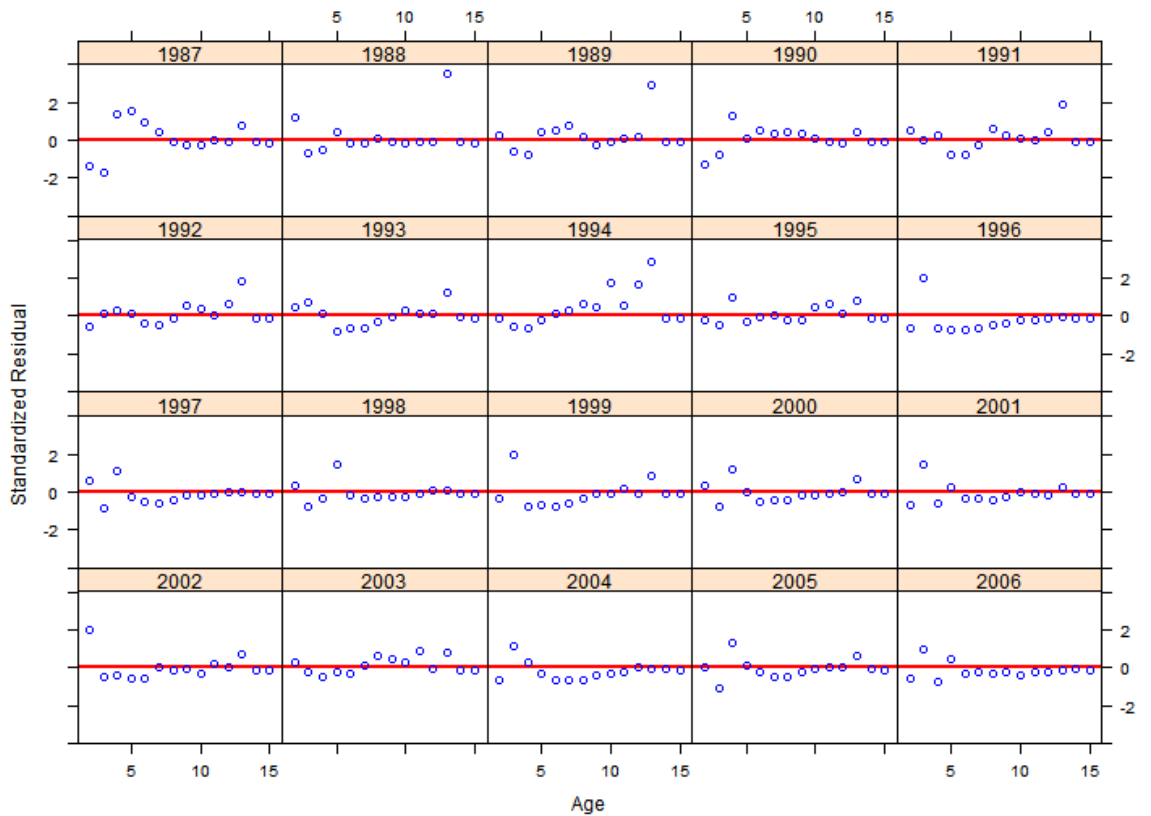


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NYOHS Age Residuals By Age

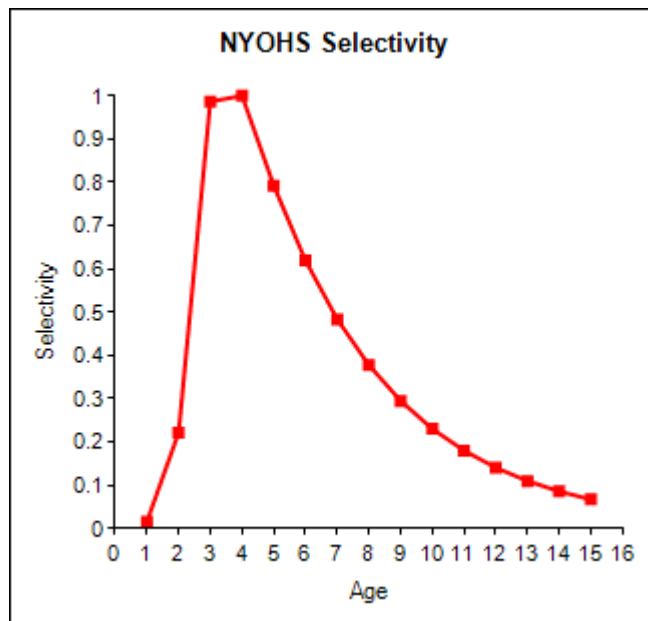
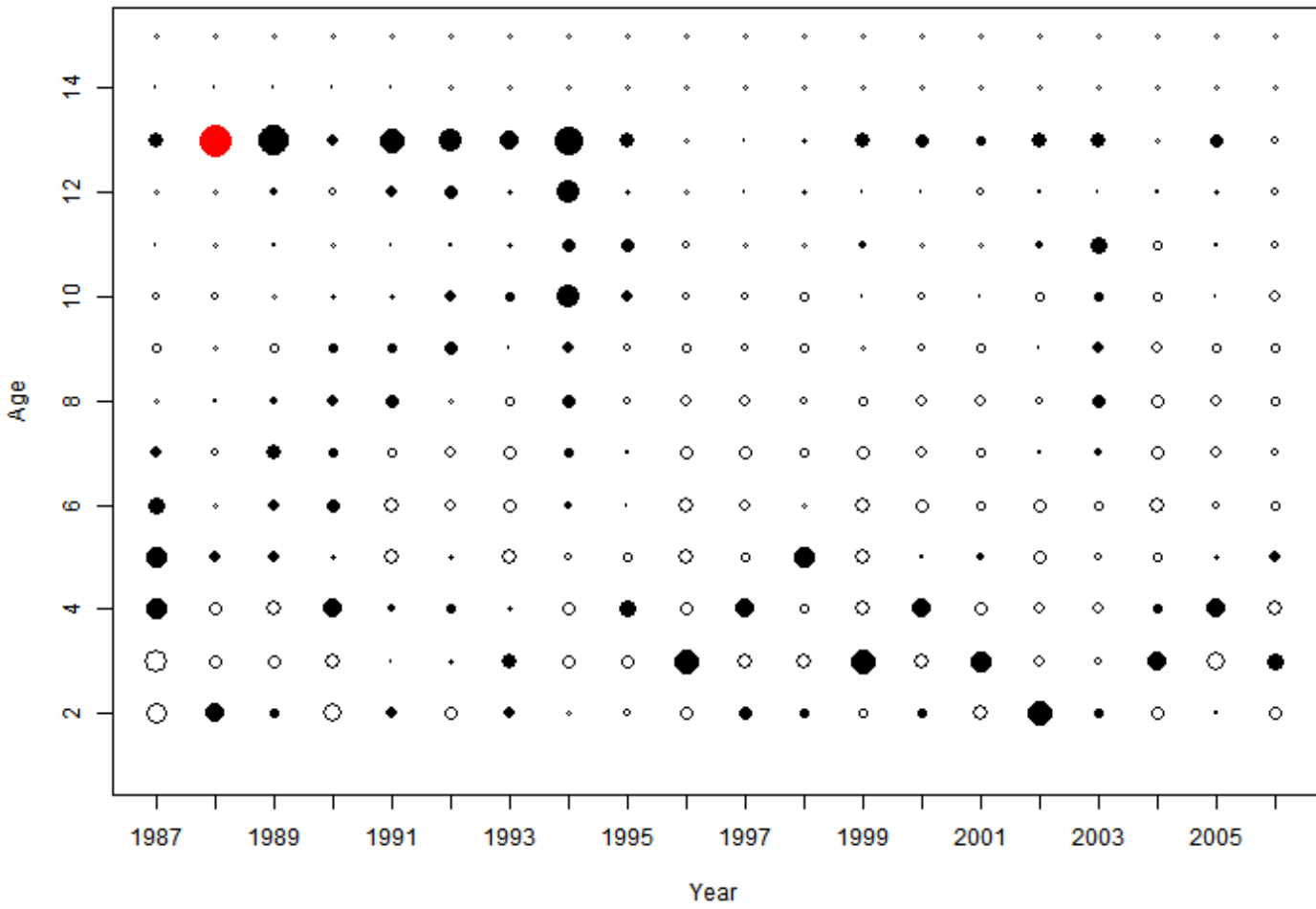


NYOHS Age Residuals By Year



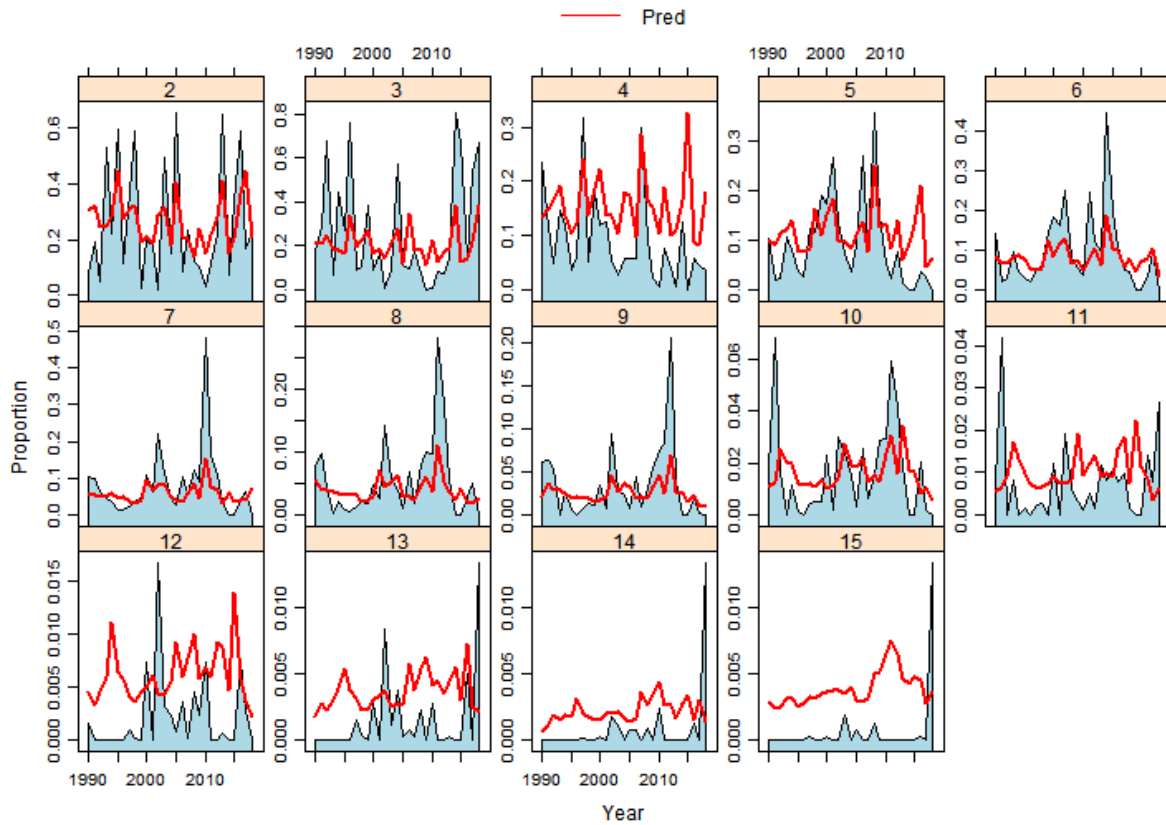
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NYOHS Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)

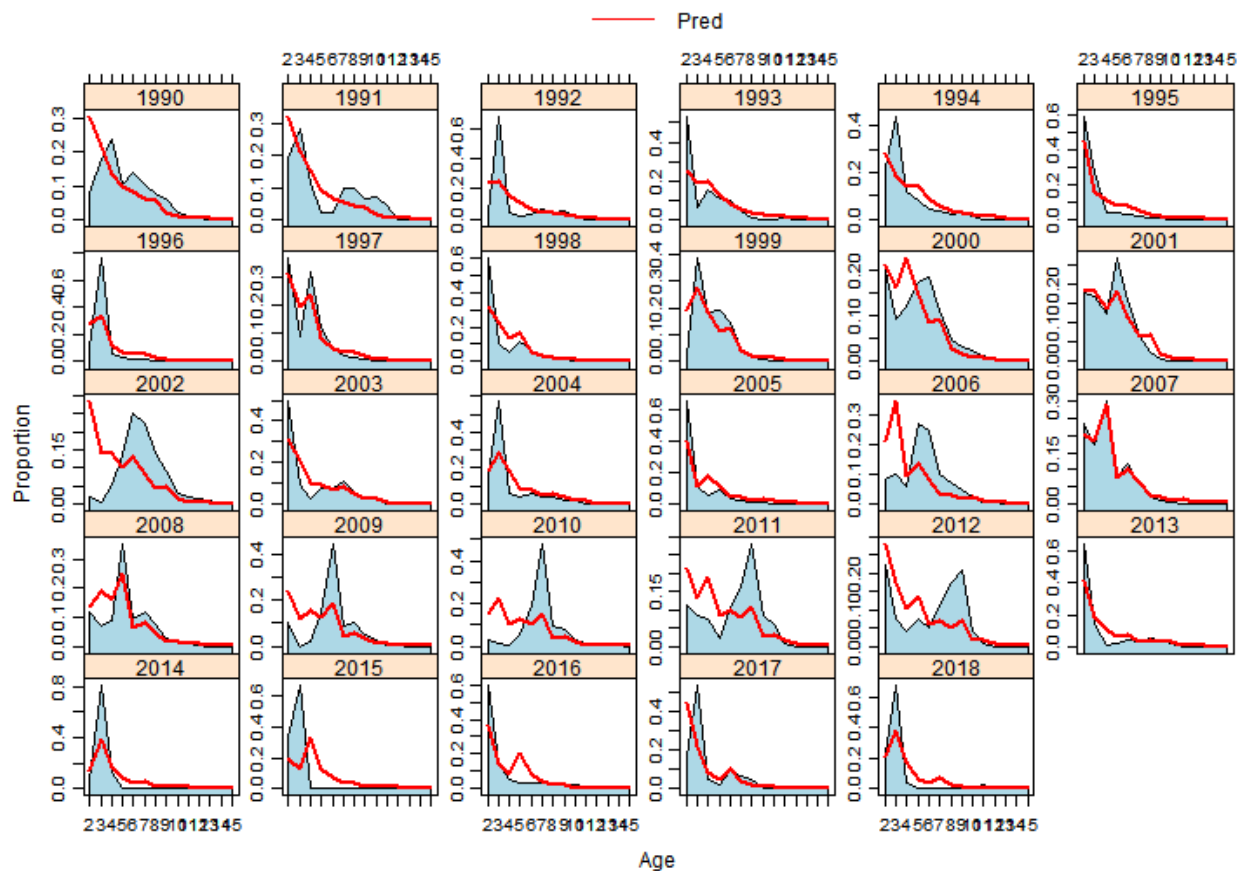


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NJ Trawl Age Composition By Age

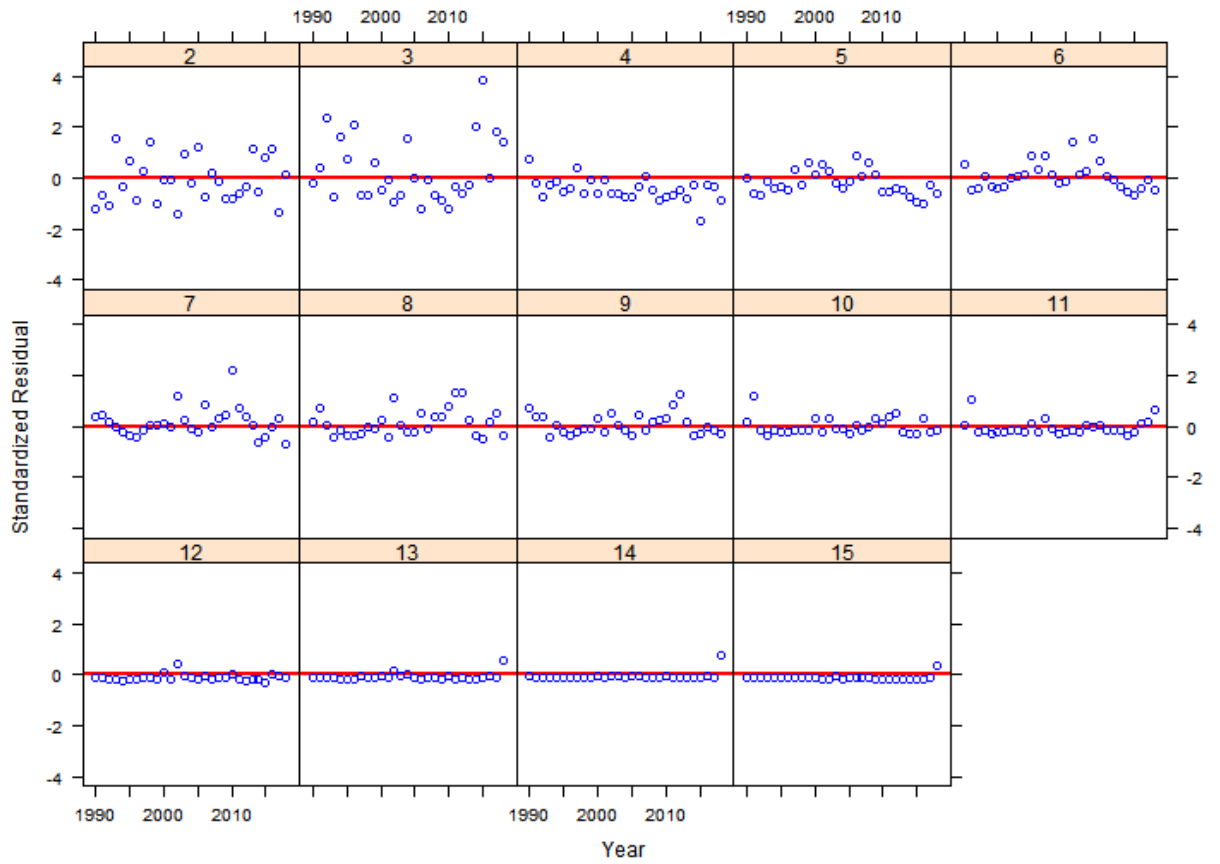


NJ Trawl Age Composition By Year

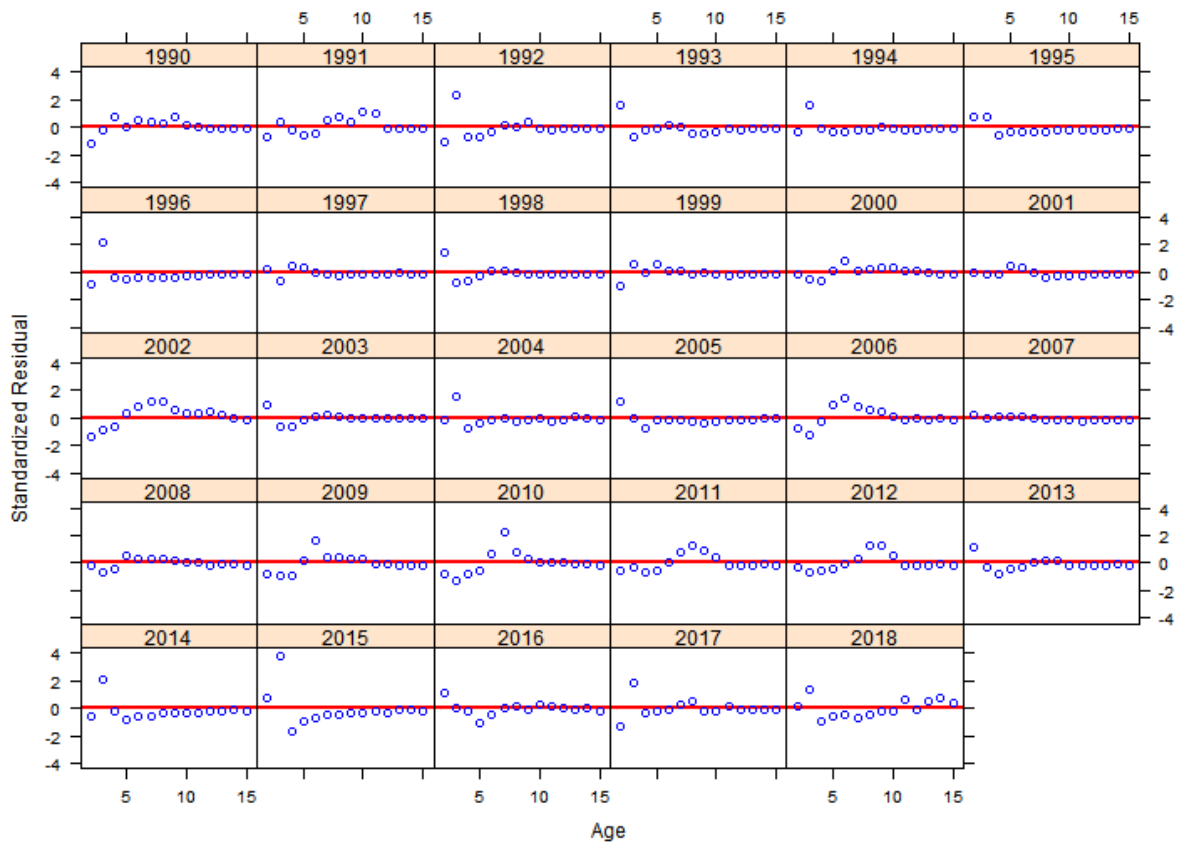


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NJTrawl Age Residuals By Age

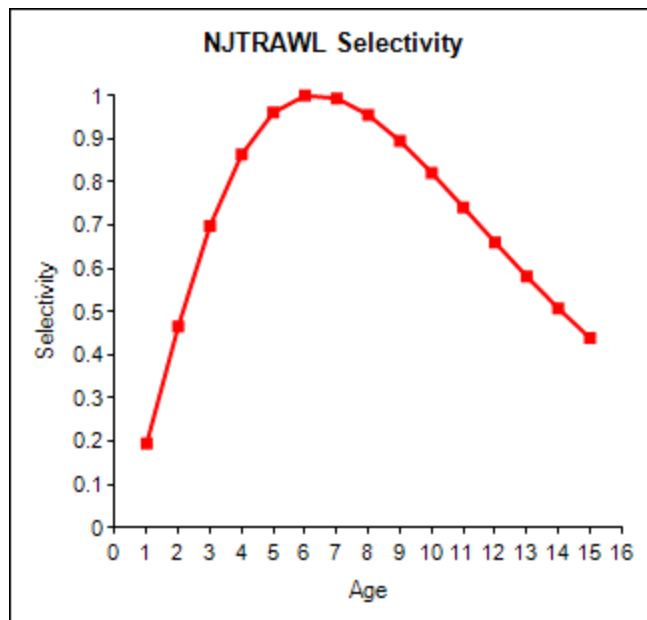
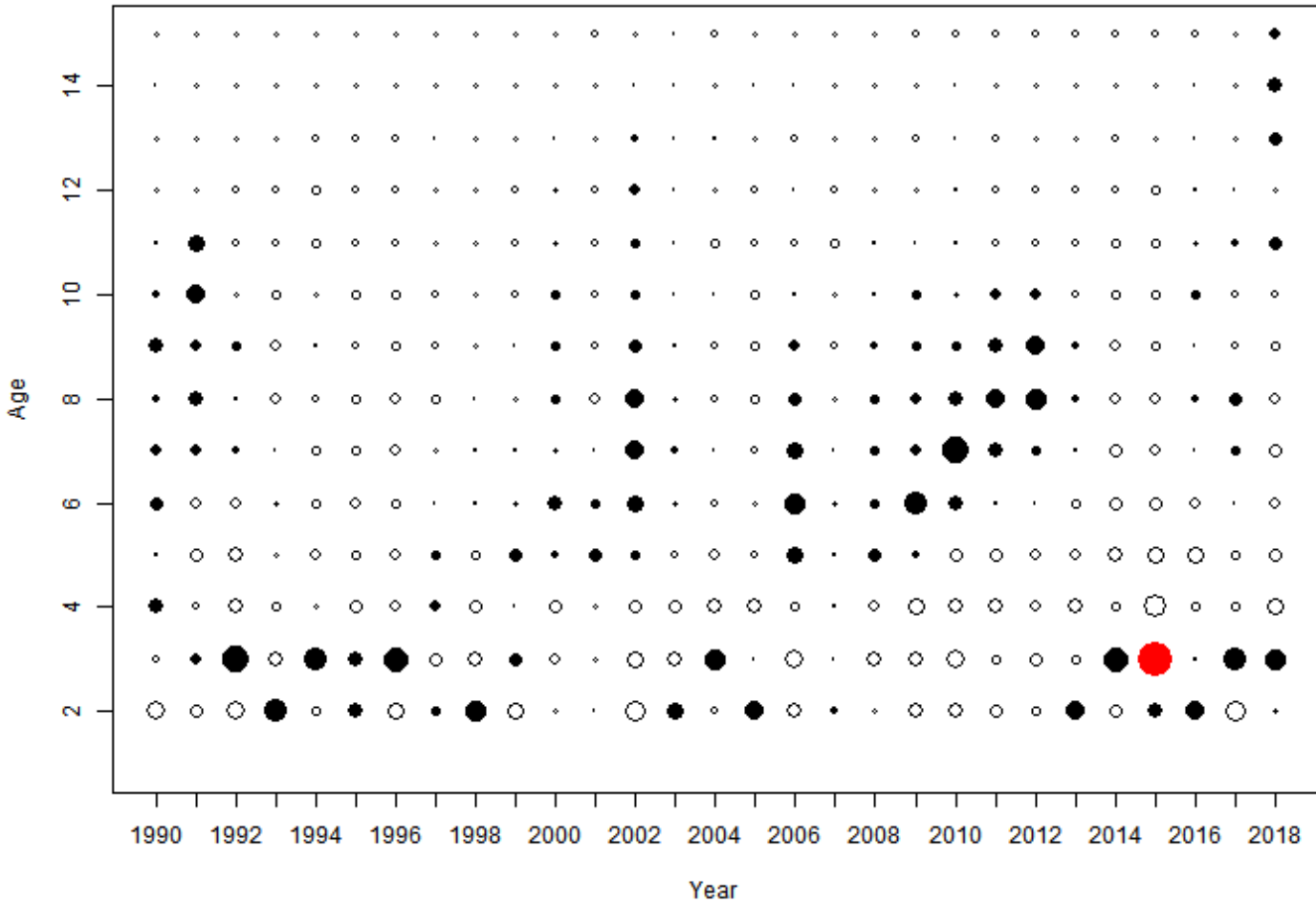


NJTrawl Age Residuals By Year



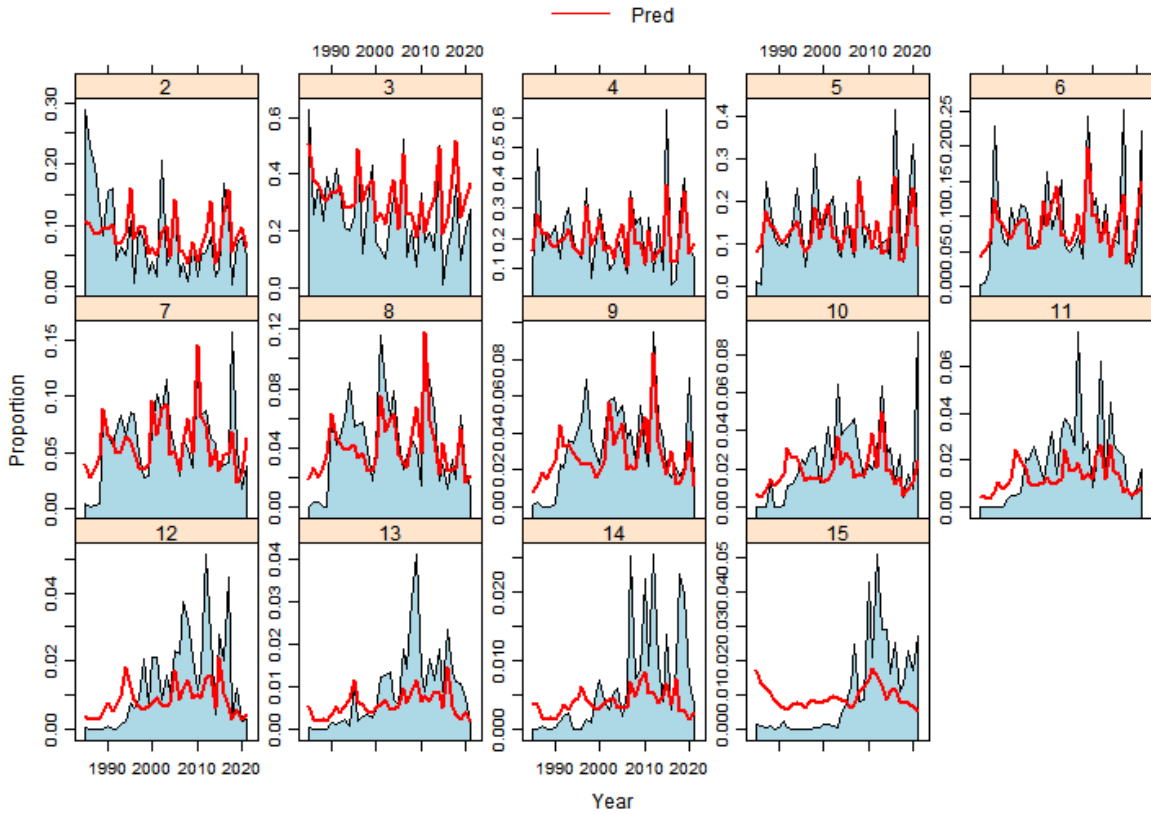
Draft for Board Review

NJTrawl Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)

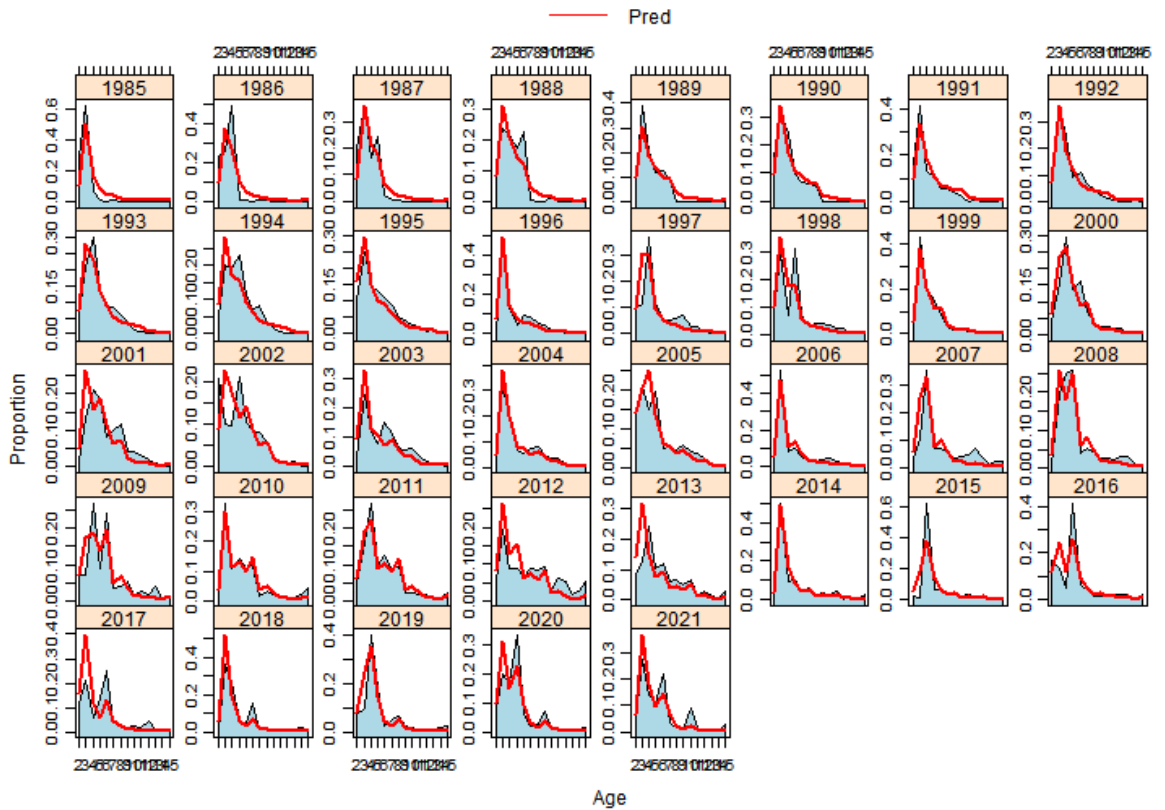


Draft for Board Review

MDSSN Age Composition By Age

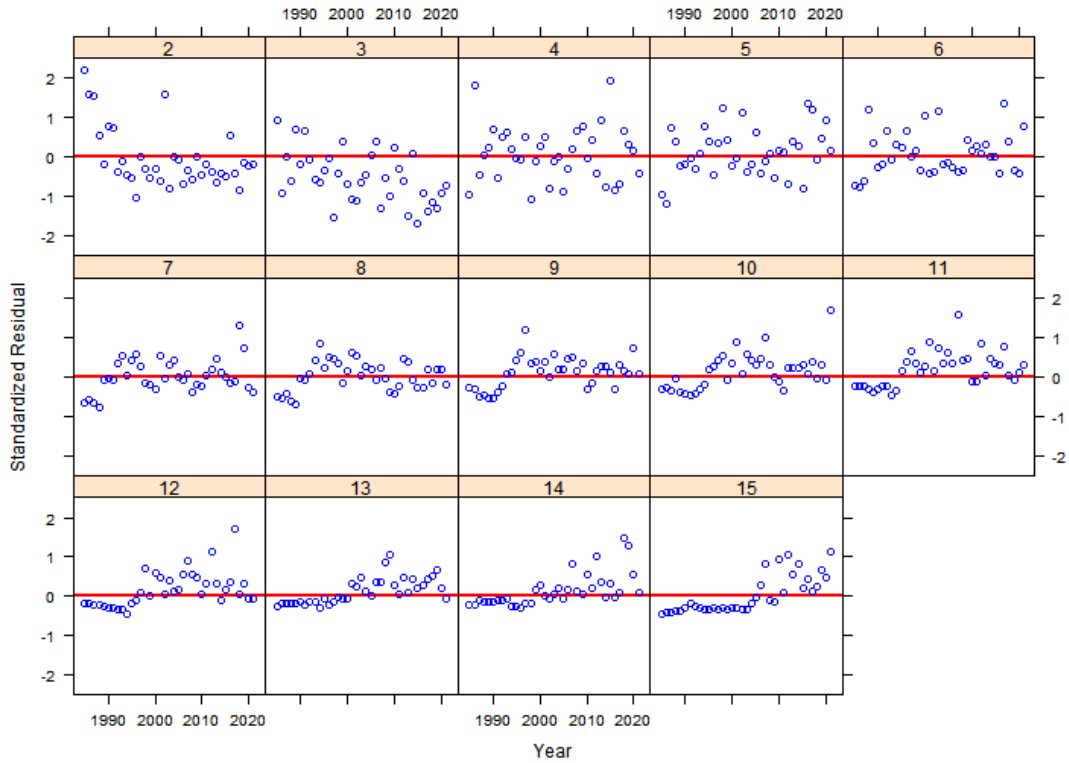


MDSSN Age Composition By Year

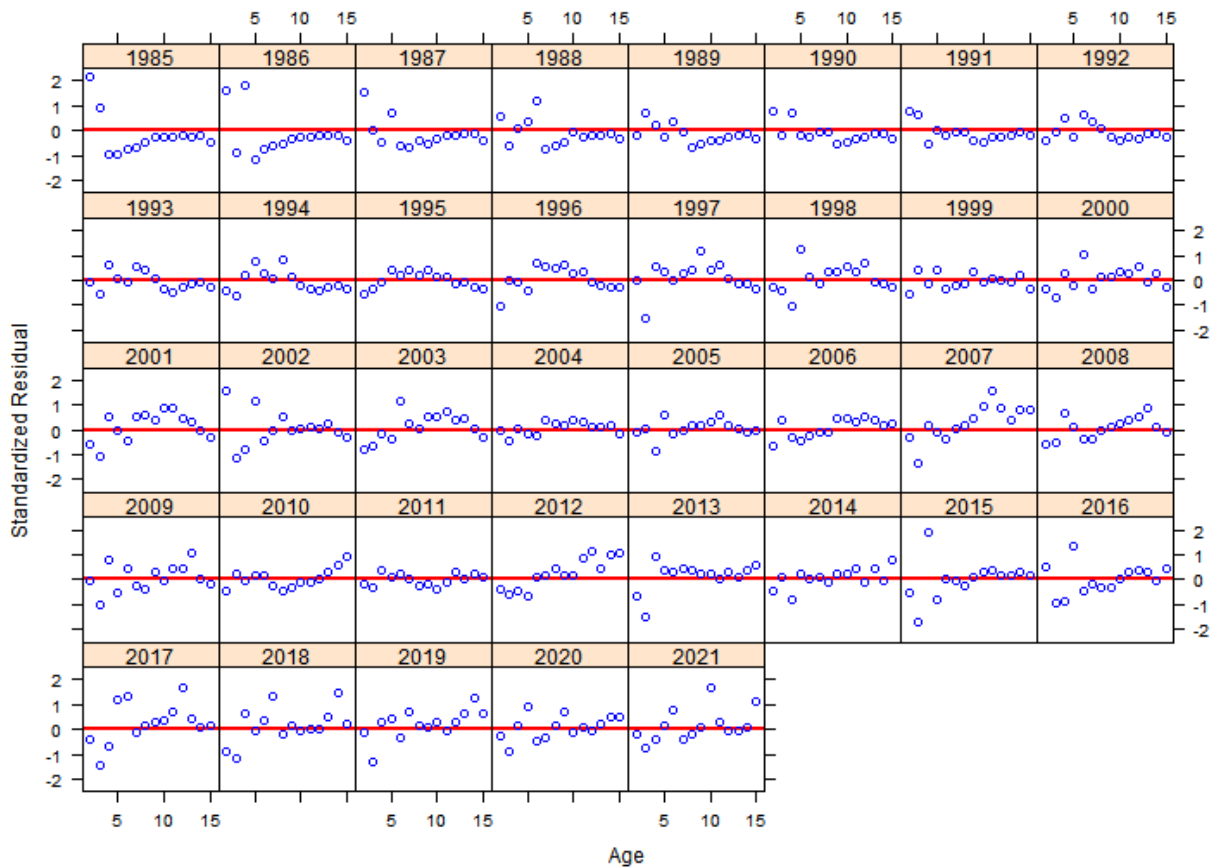


Draft for Board Review

MDSSN Age Residuals By Age

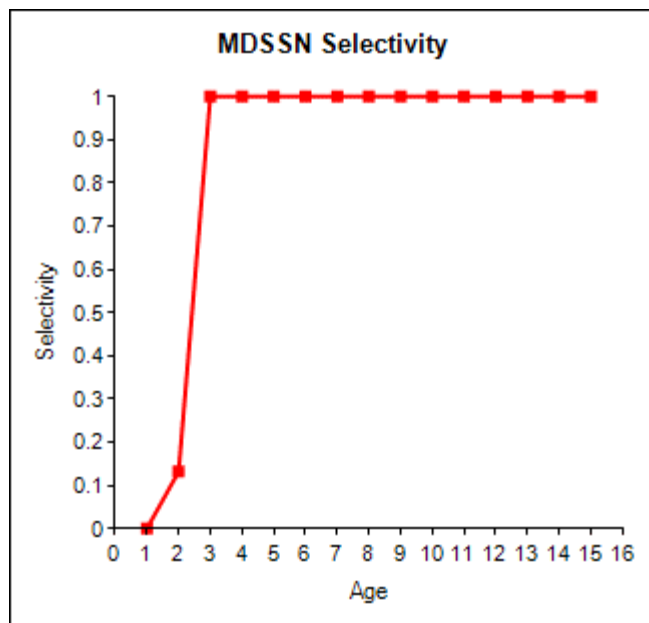
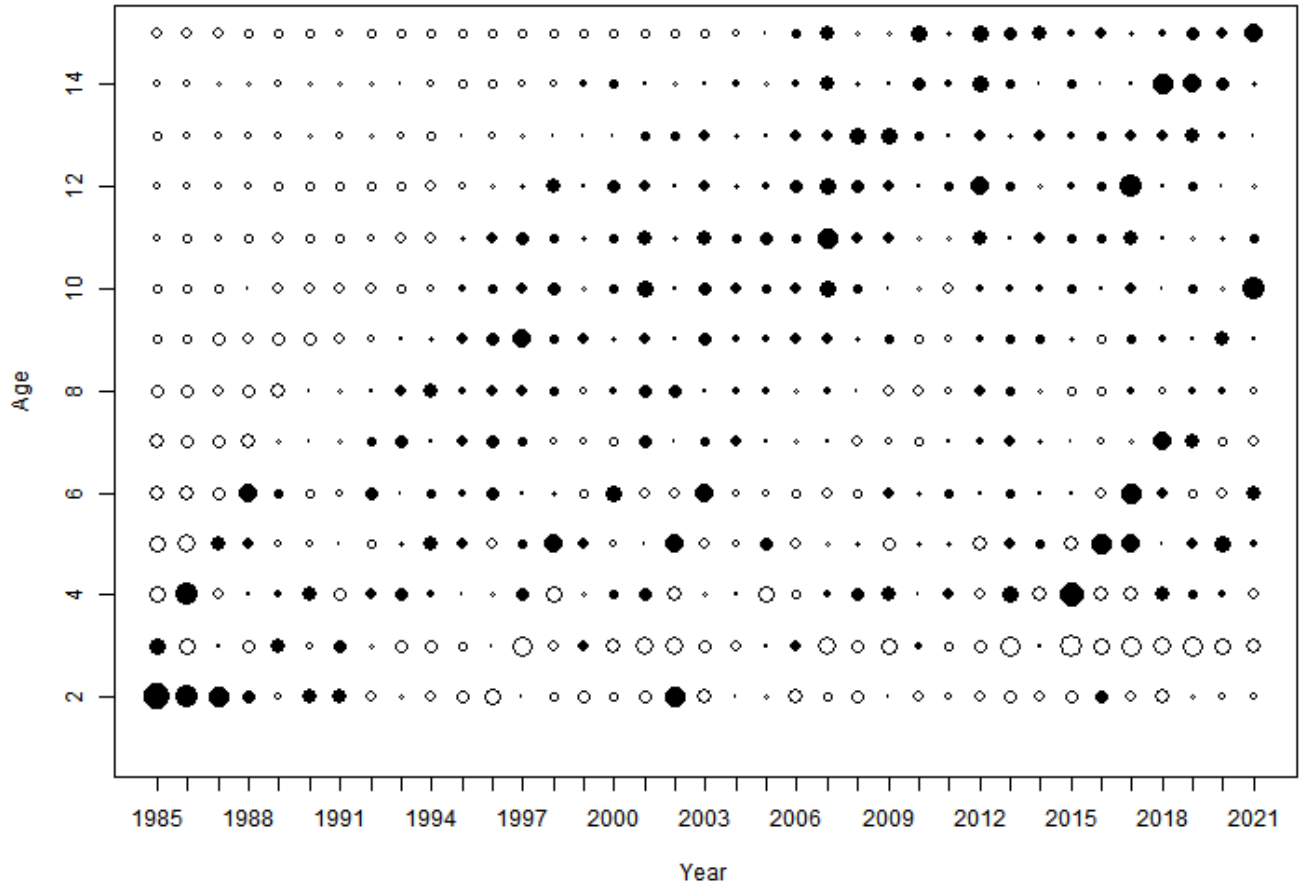


MDSSN Age Residuals By Year



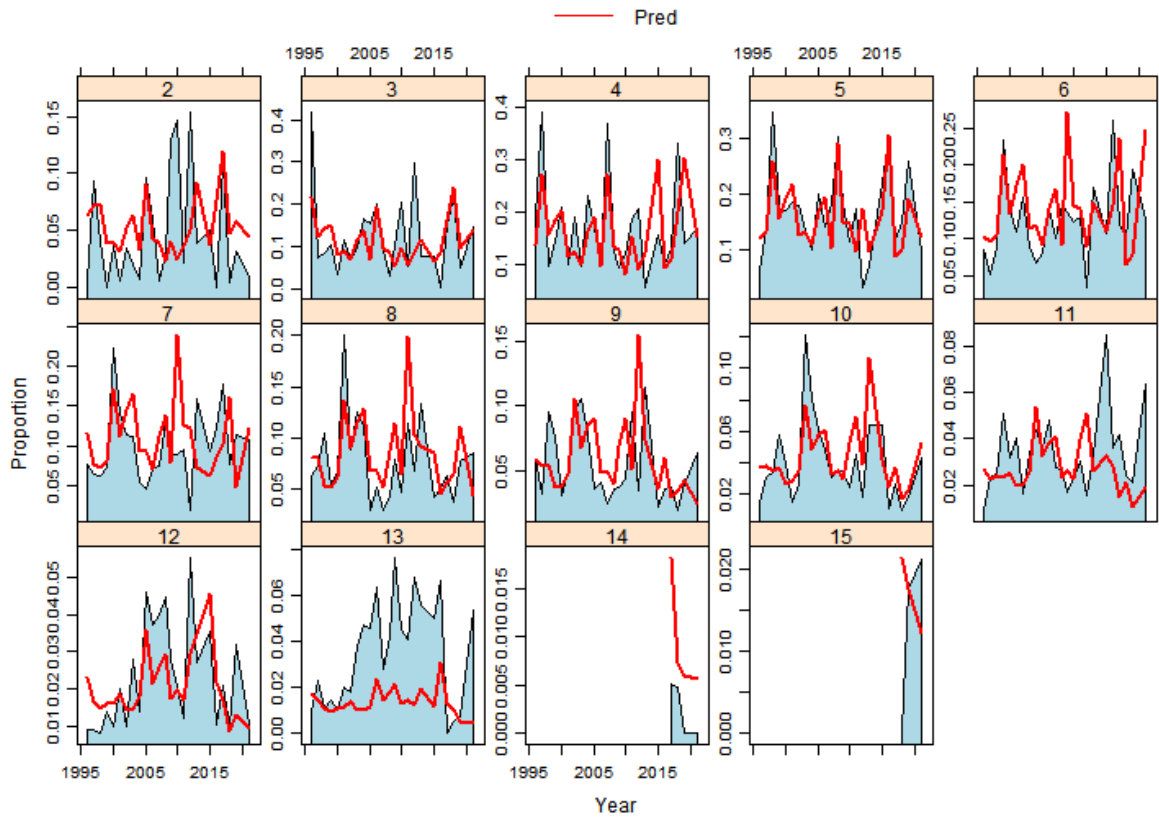
Draft for Board Review

MDSSN Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)

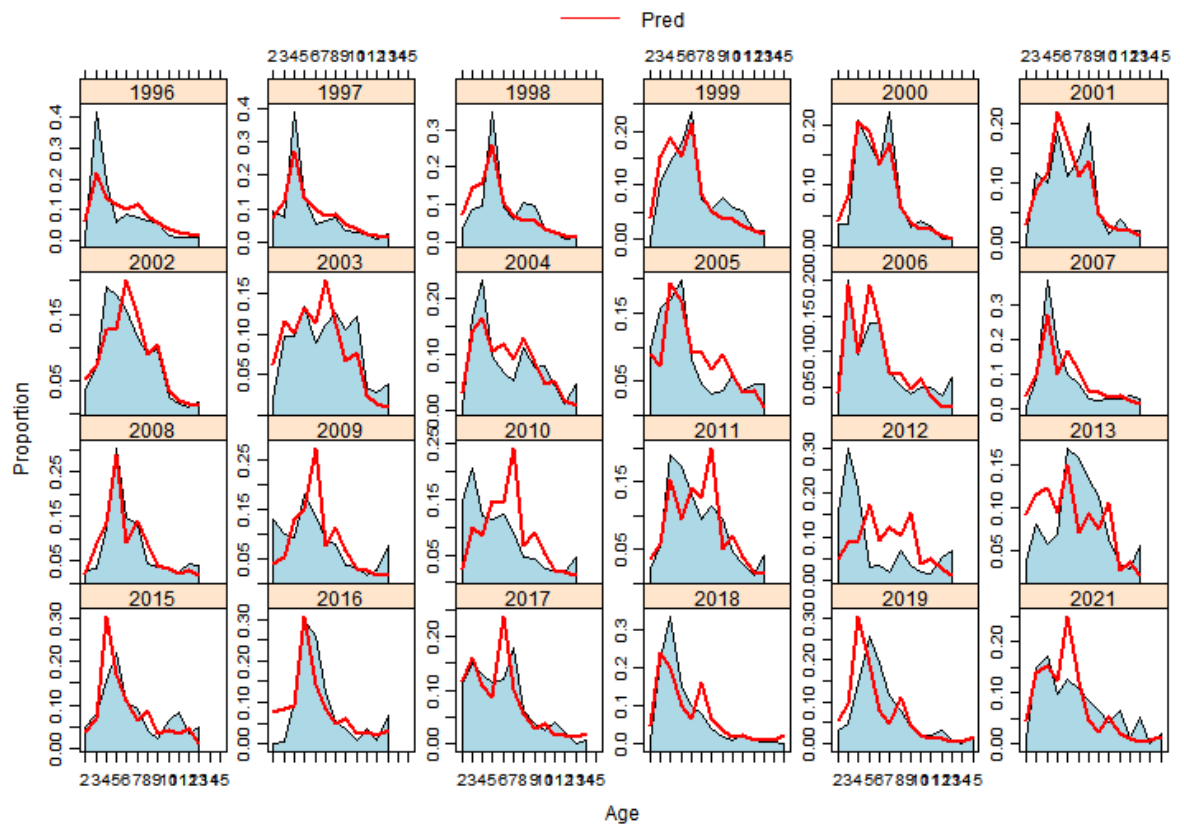


Draft for Board Review

DESSN Age Composition By Age

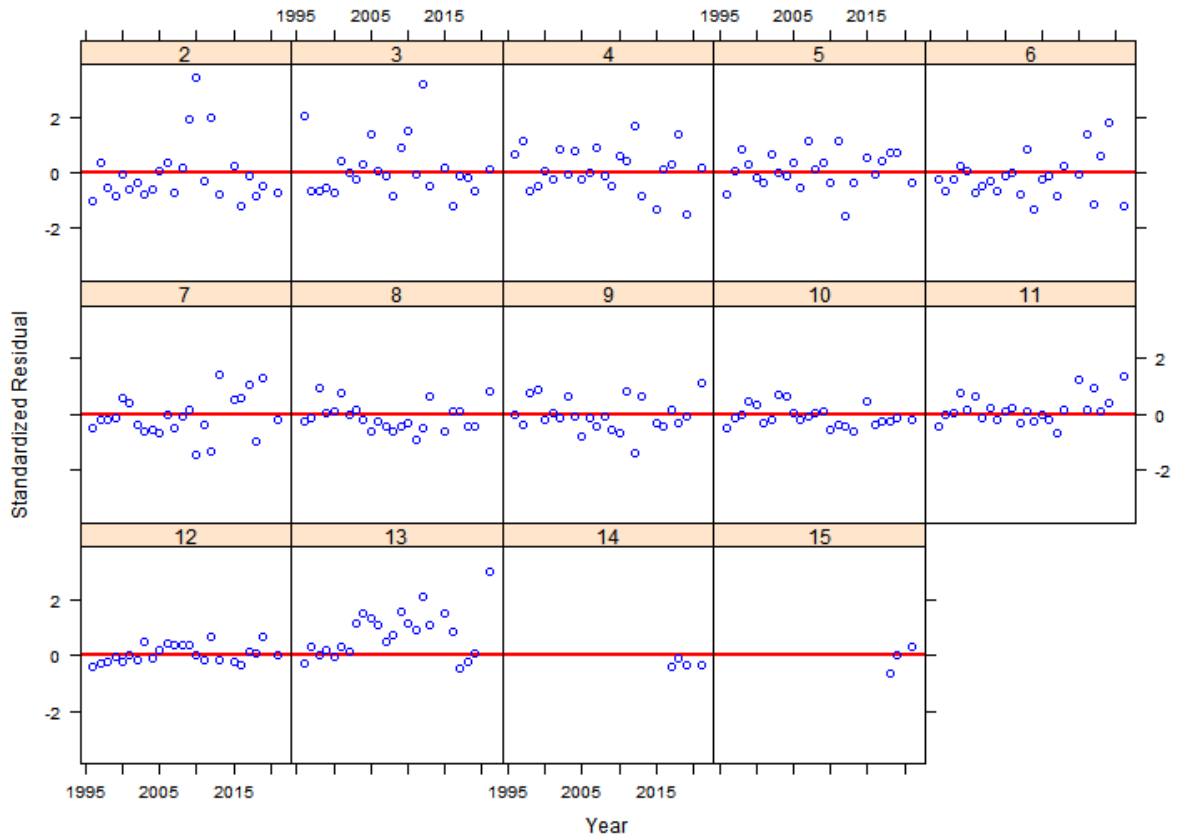


DESSN Age Composition By Year

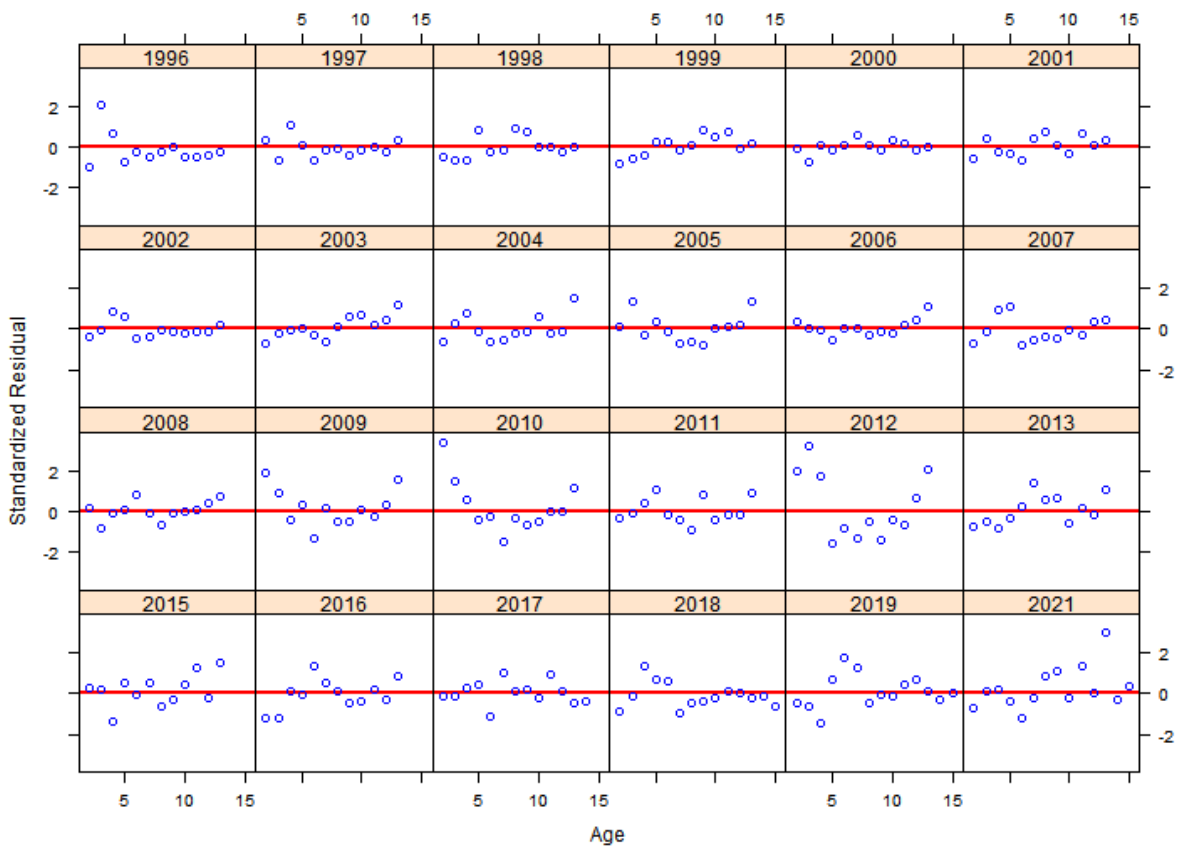


Draft for Board Review

DESSN Age Residuals By Age

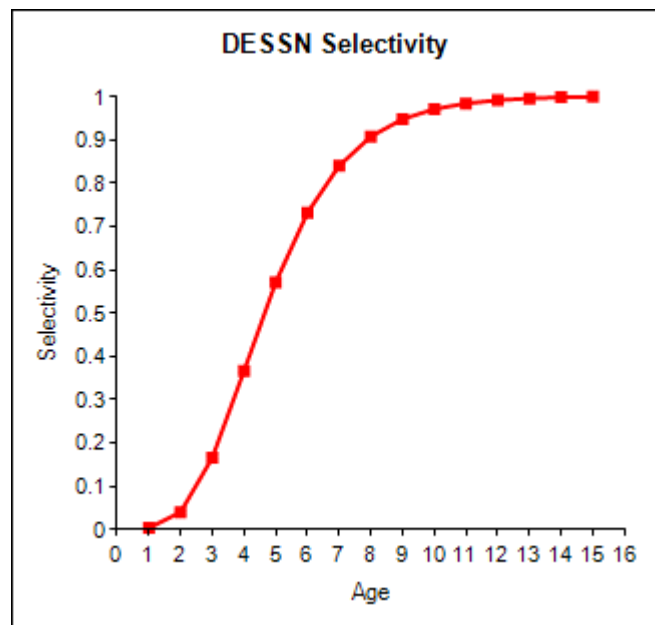
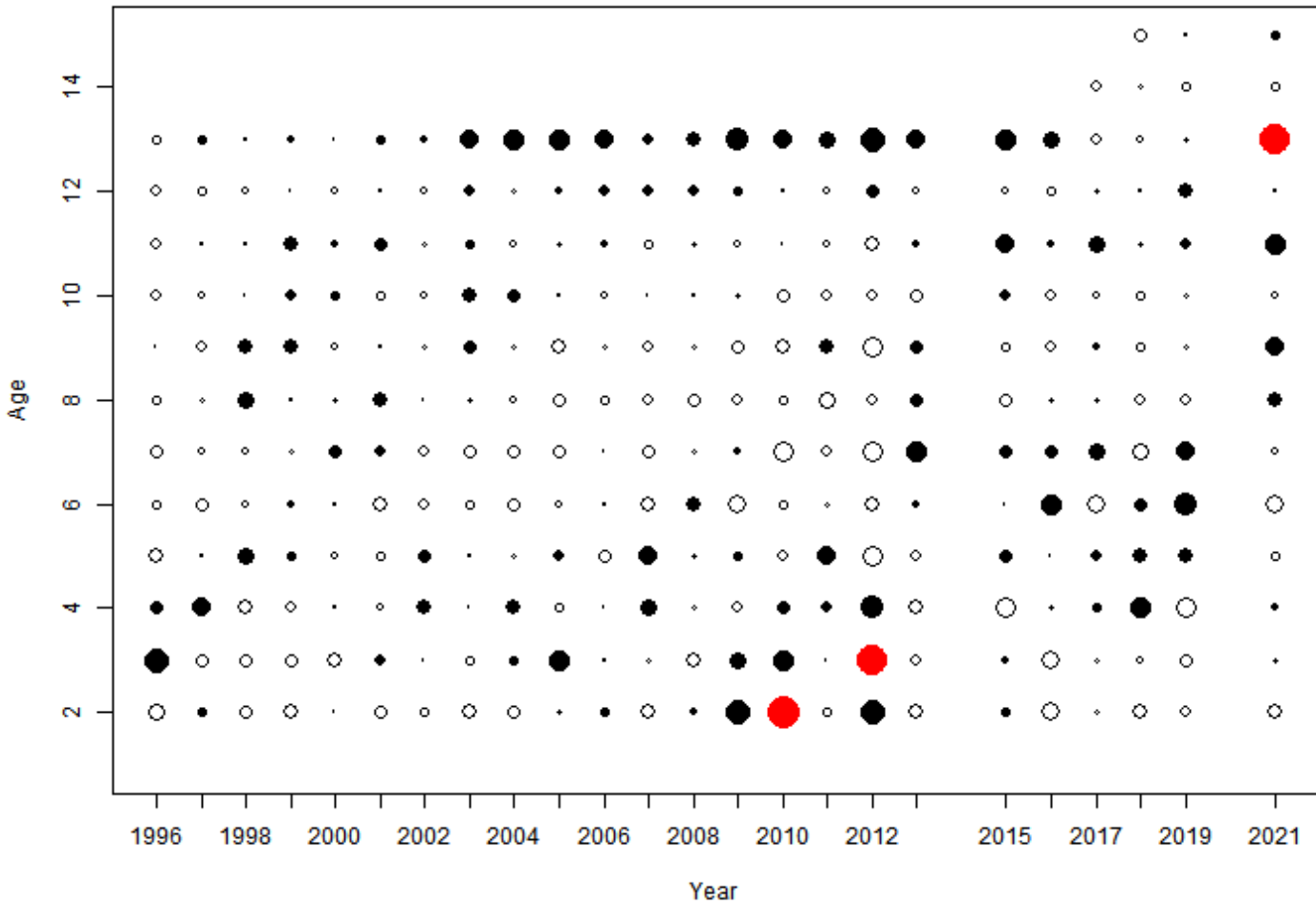


DESSN Age Residuals By Year



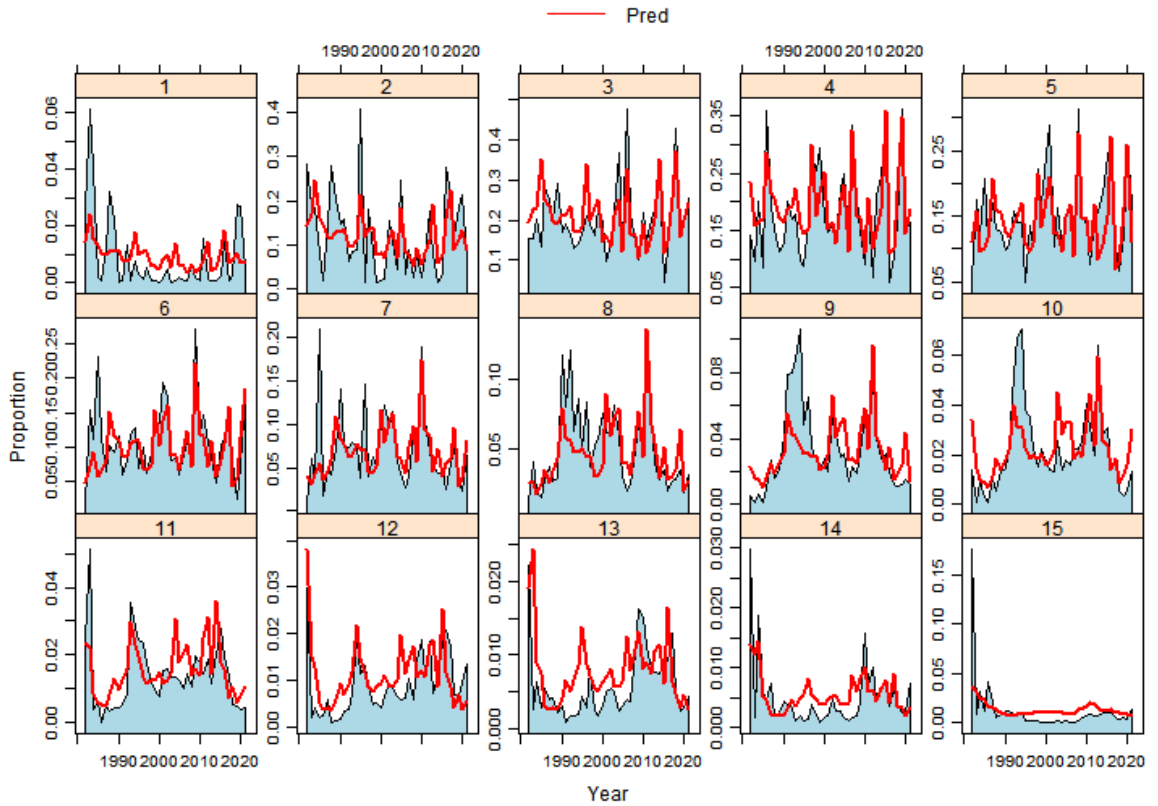
Draft for Board Review

DESSN Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)

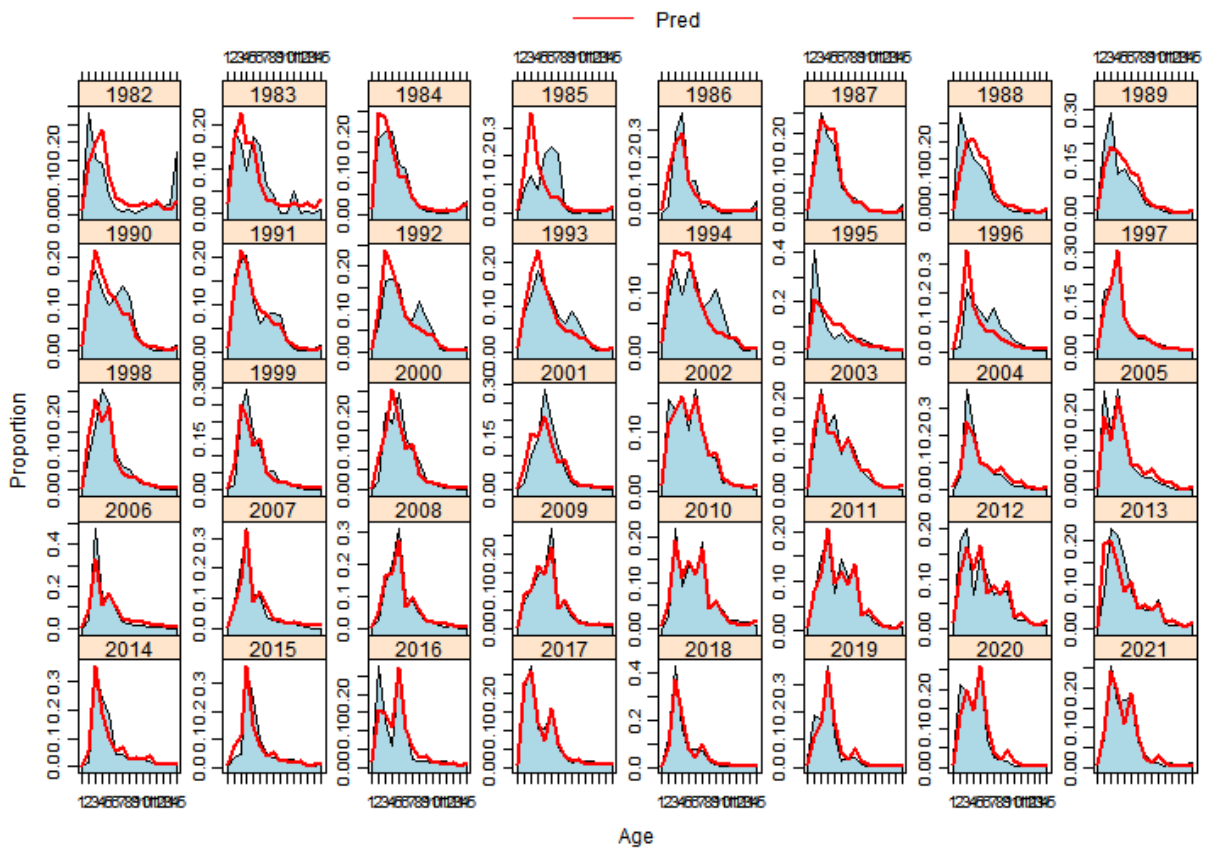


Draft for Board Review

MRIP Age Composition By Age

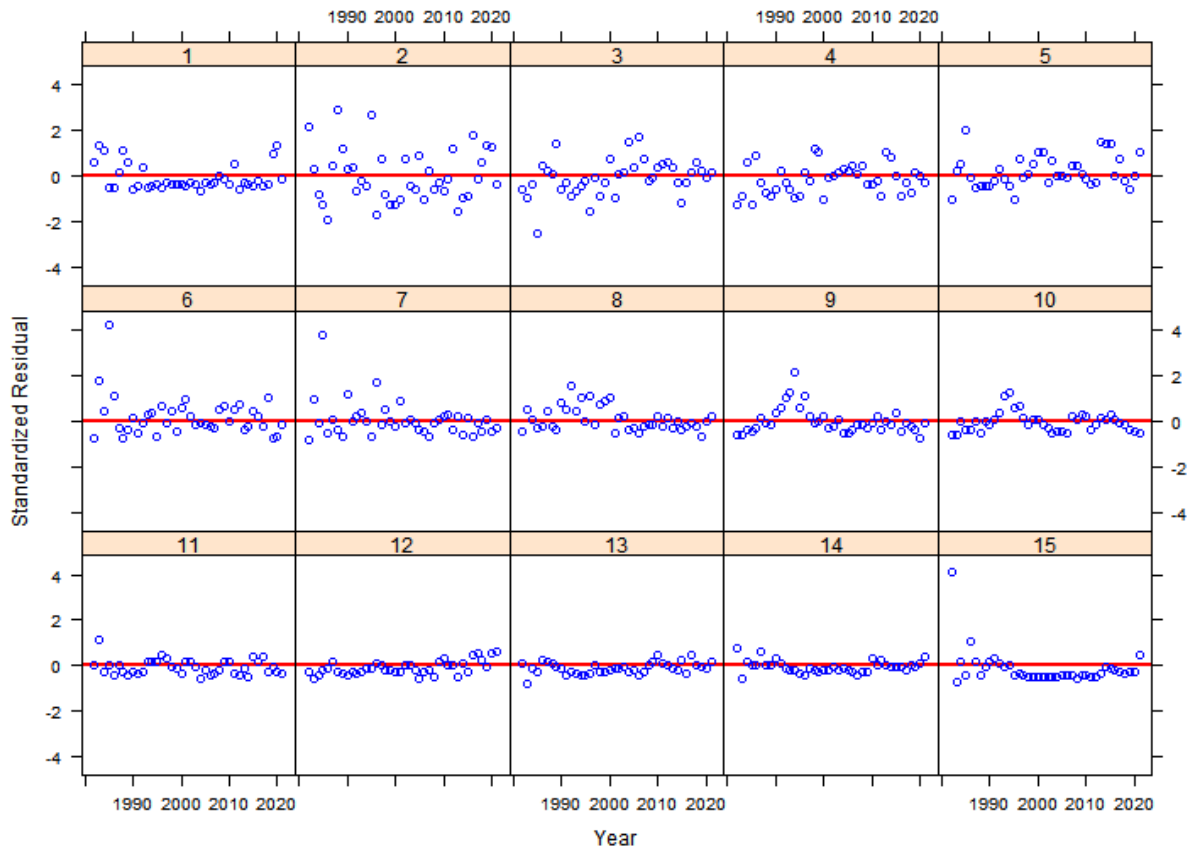


MRIP Age Composition By Year

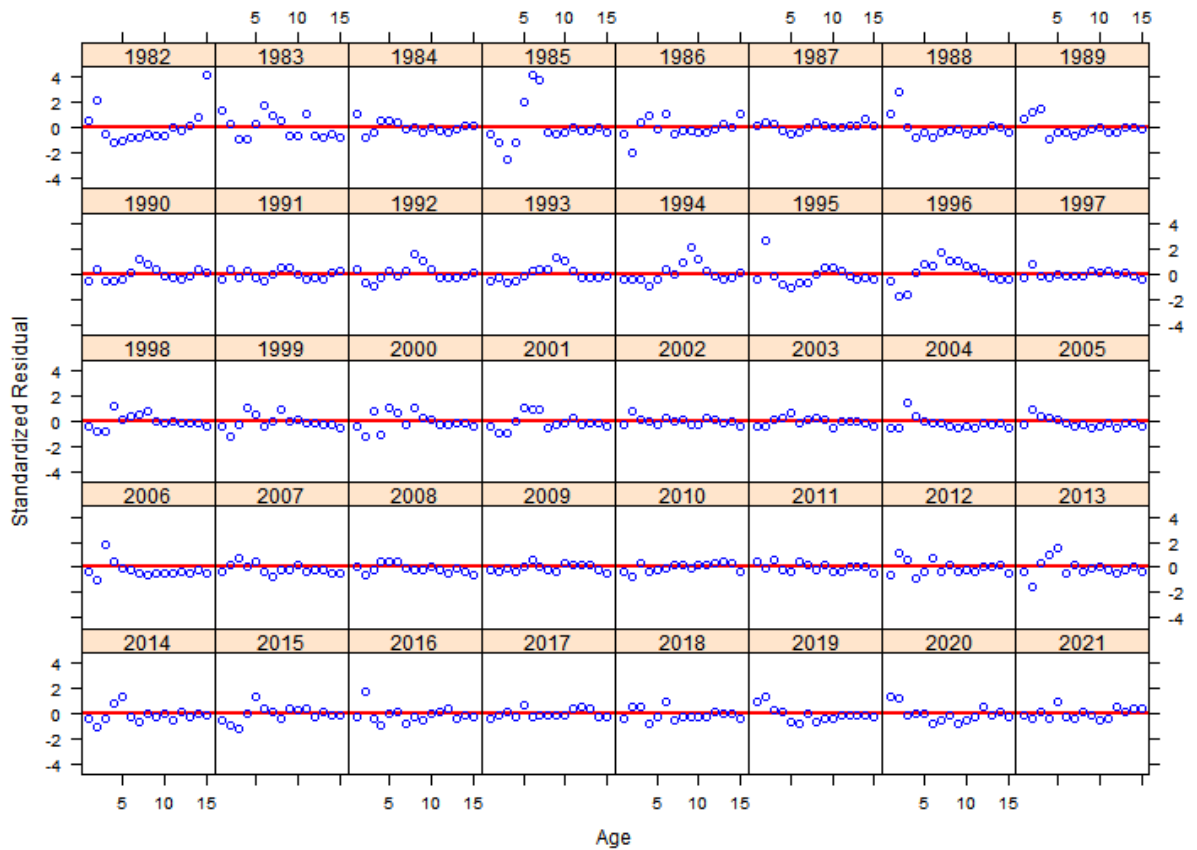


Draft for Board Review

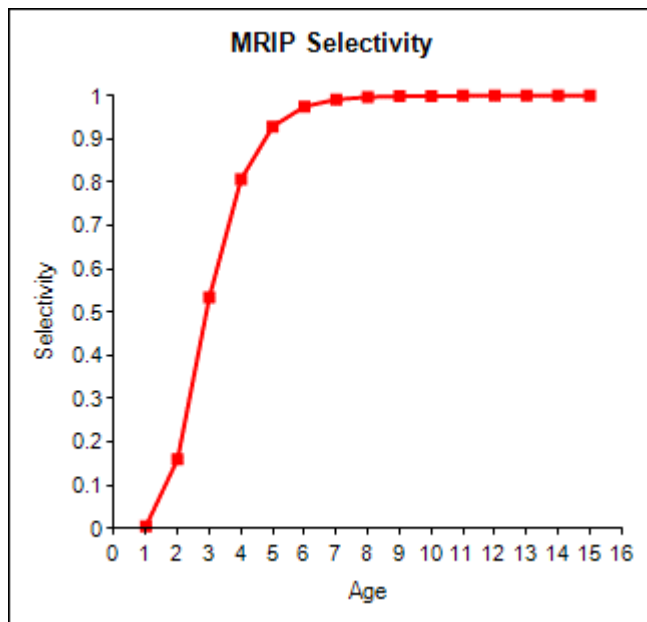
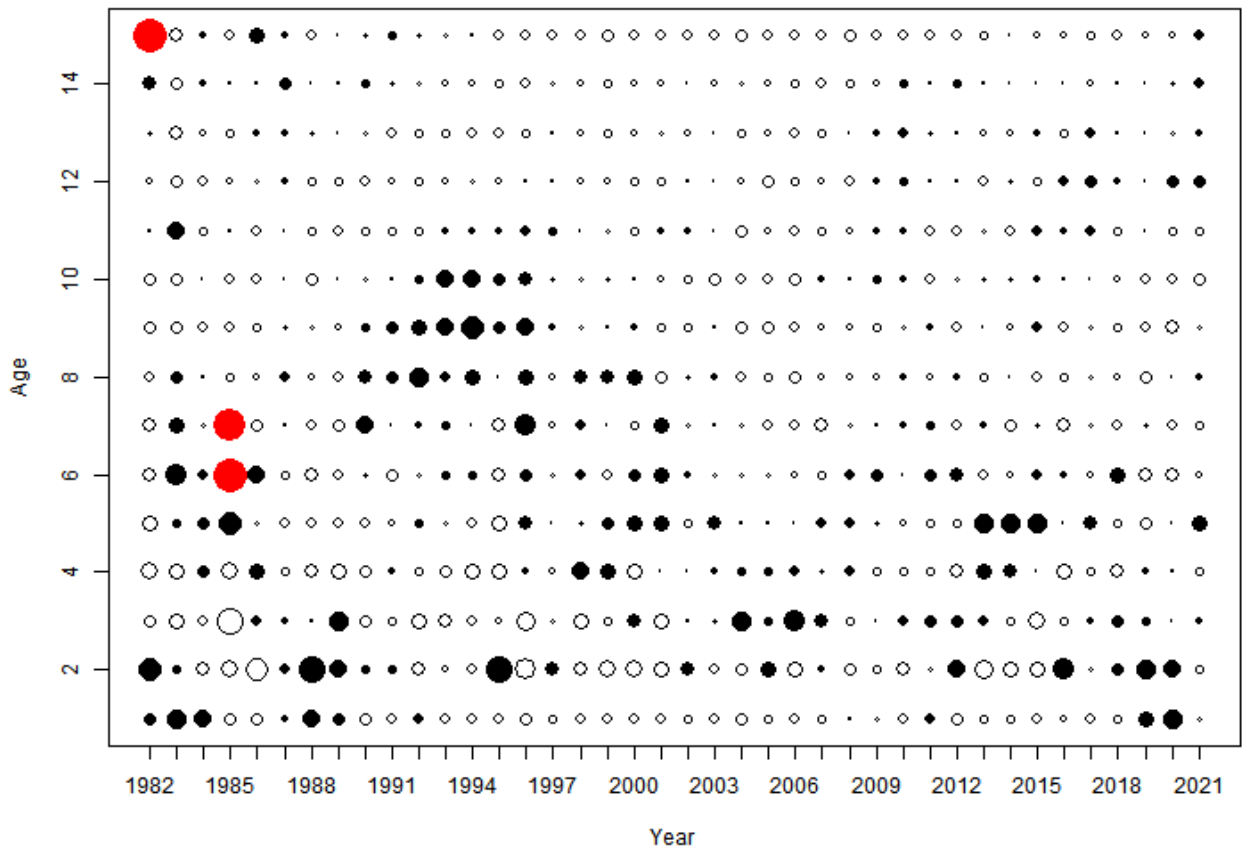
MRIP Age Residuals By Age



MRIP Age Residuals By Year

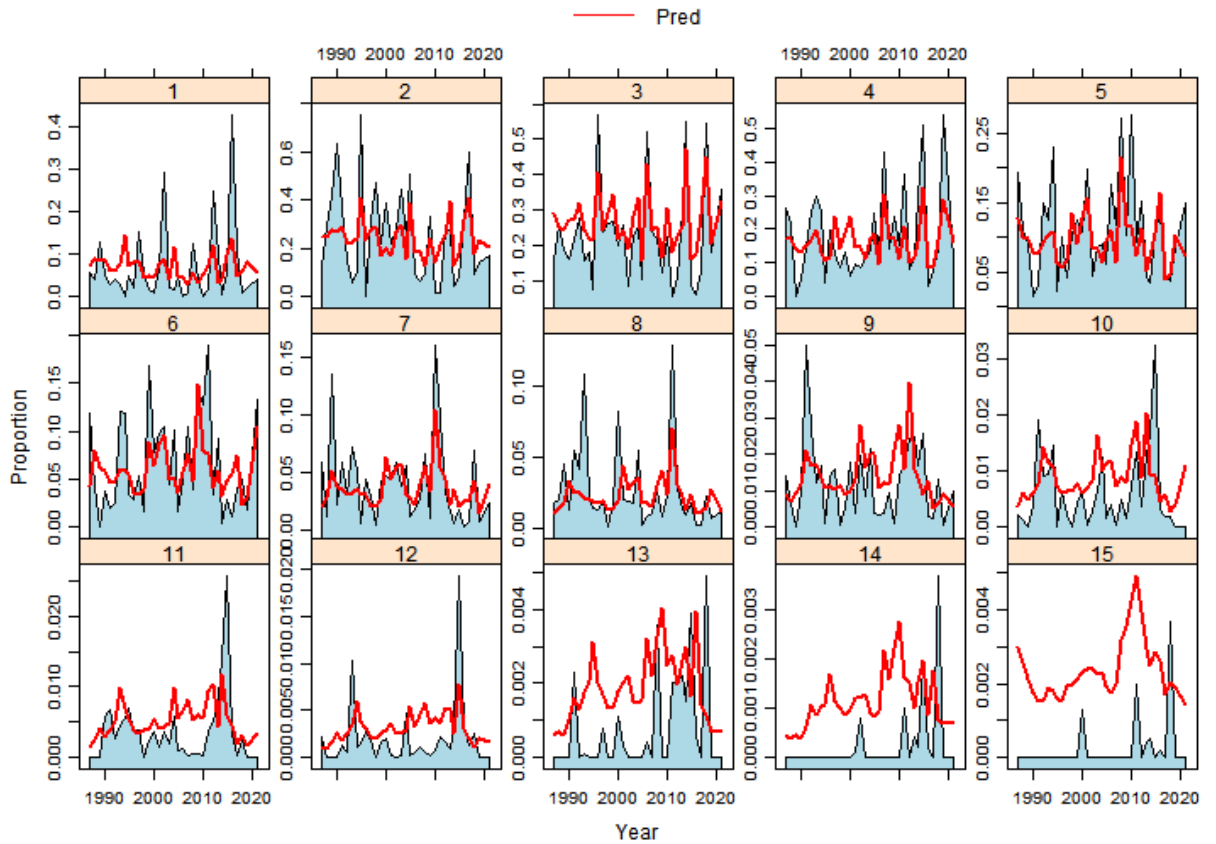


MRIP Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)

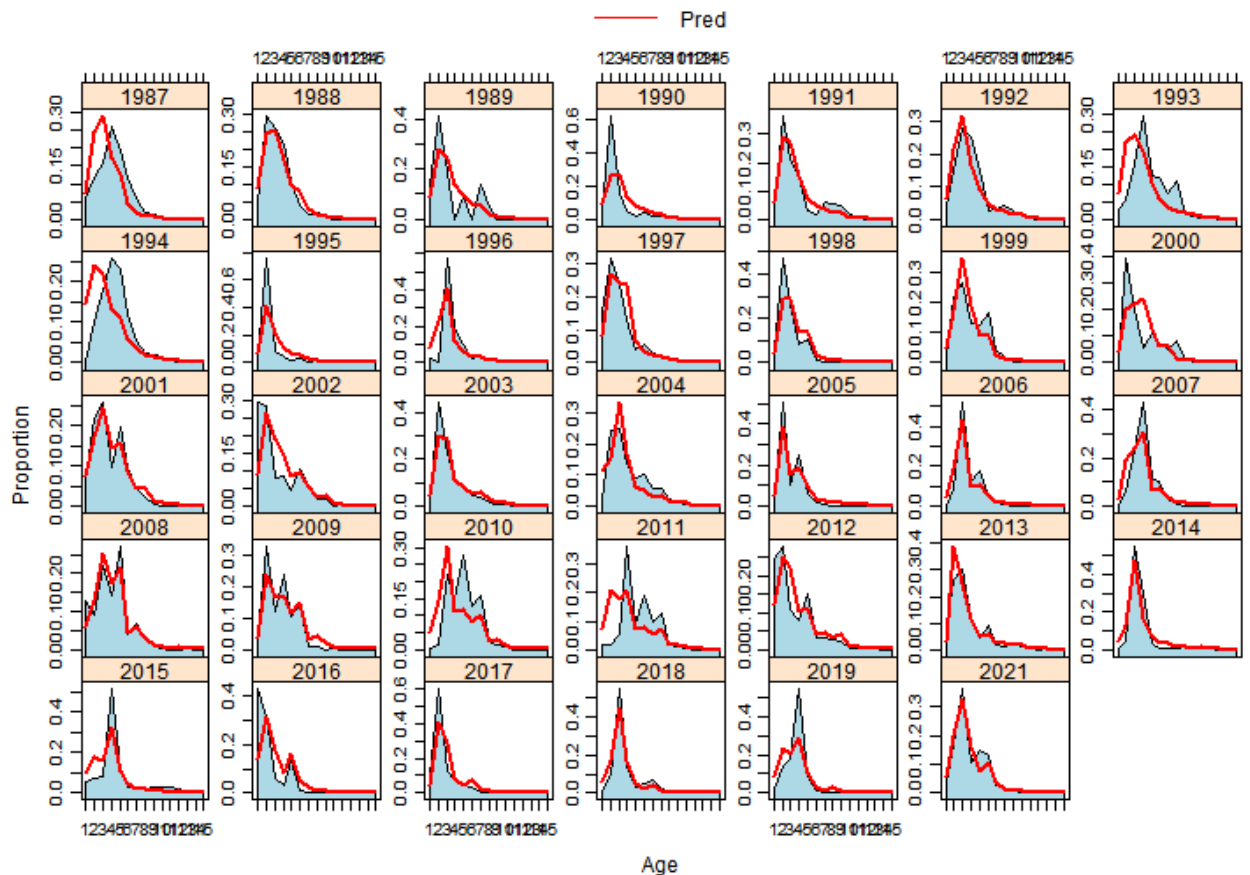


Draft for Board Review

CTLIST Age Composition By Age

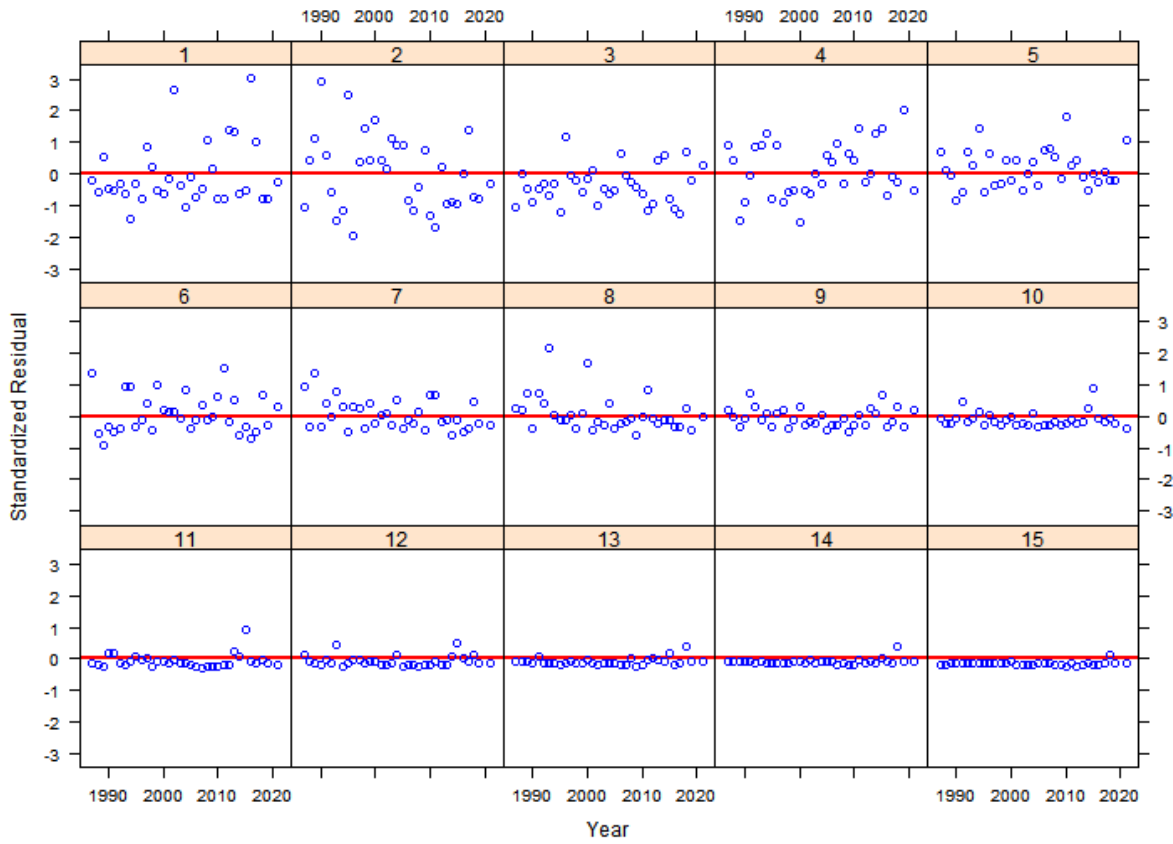


CTLIST Age Composition By Year

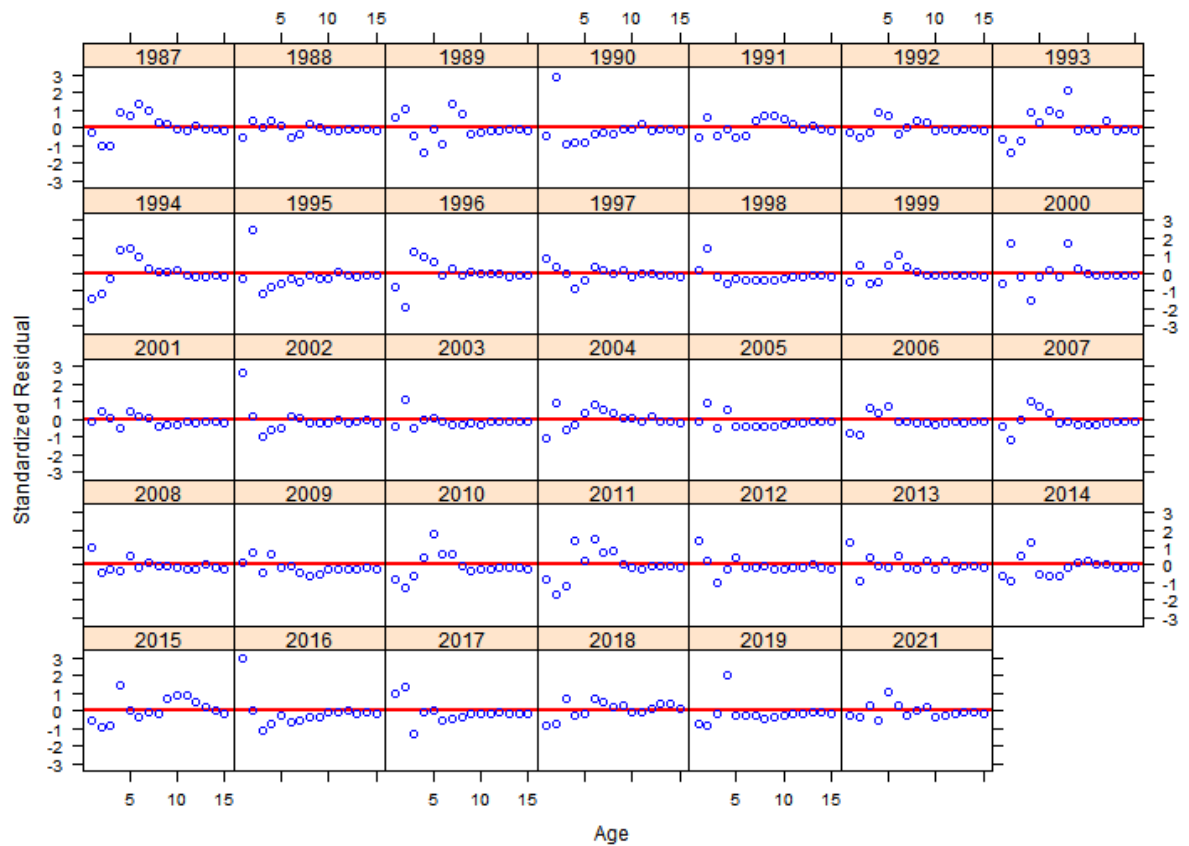


Draft for Board Review

CTLIST Age Residuals By Age

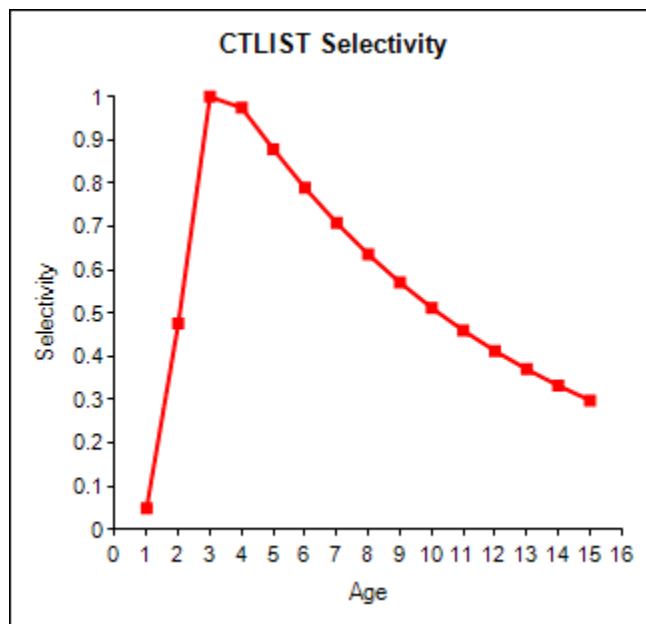
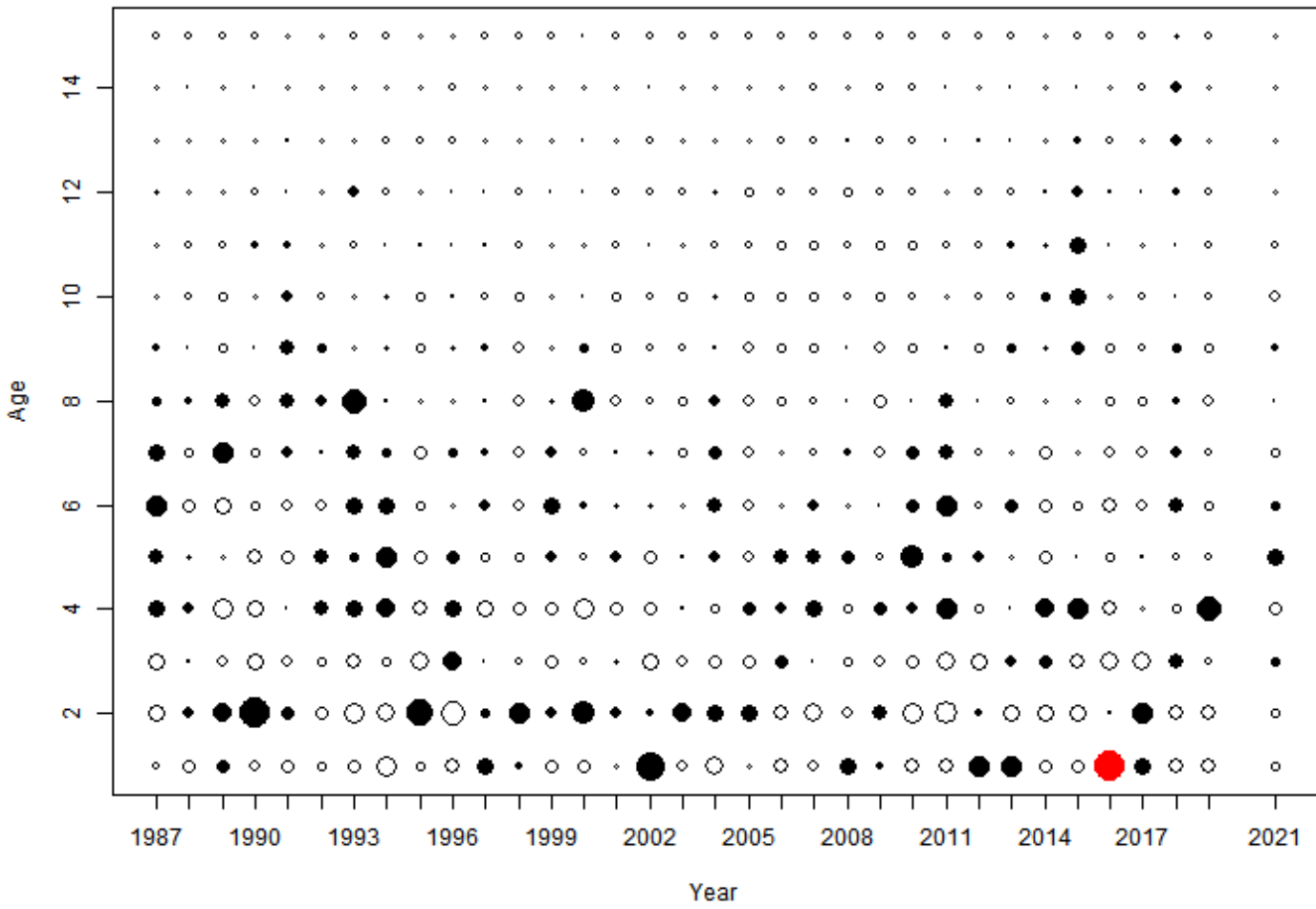


CTLIST Age Residuals By Year



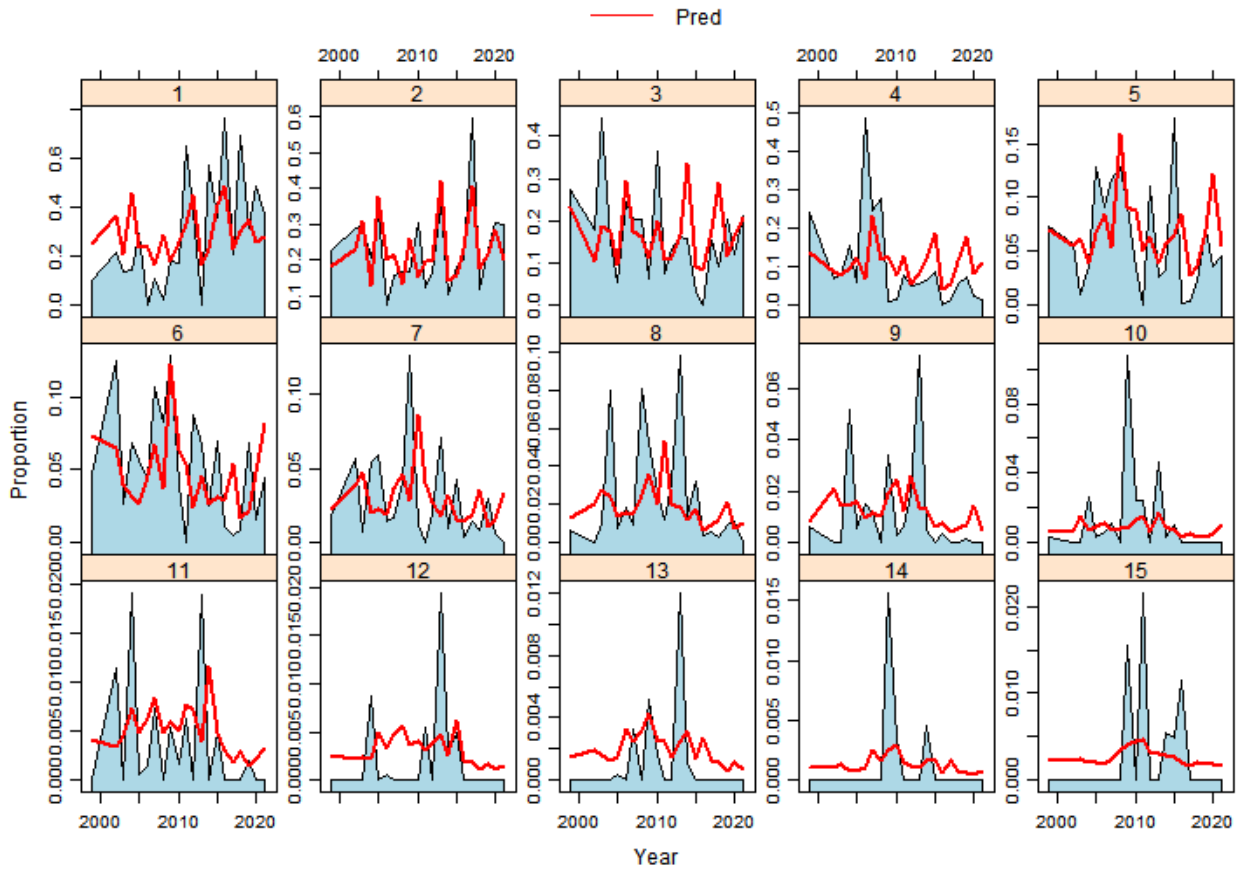
Draft for Board Review

CTLIST Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)

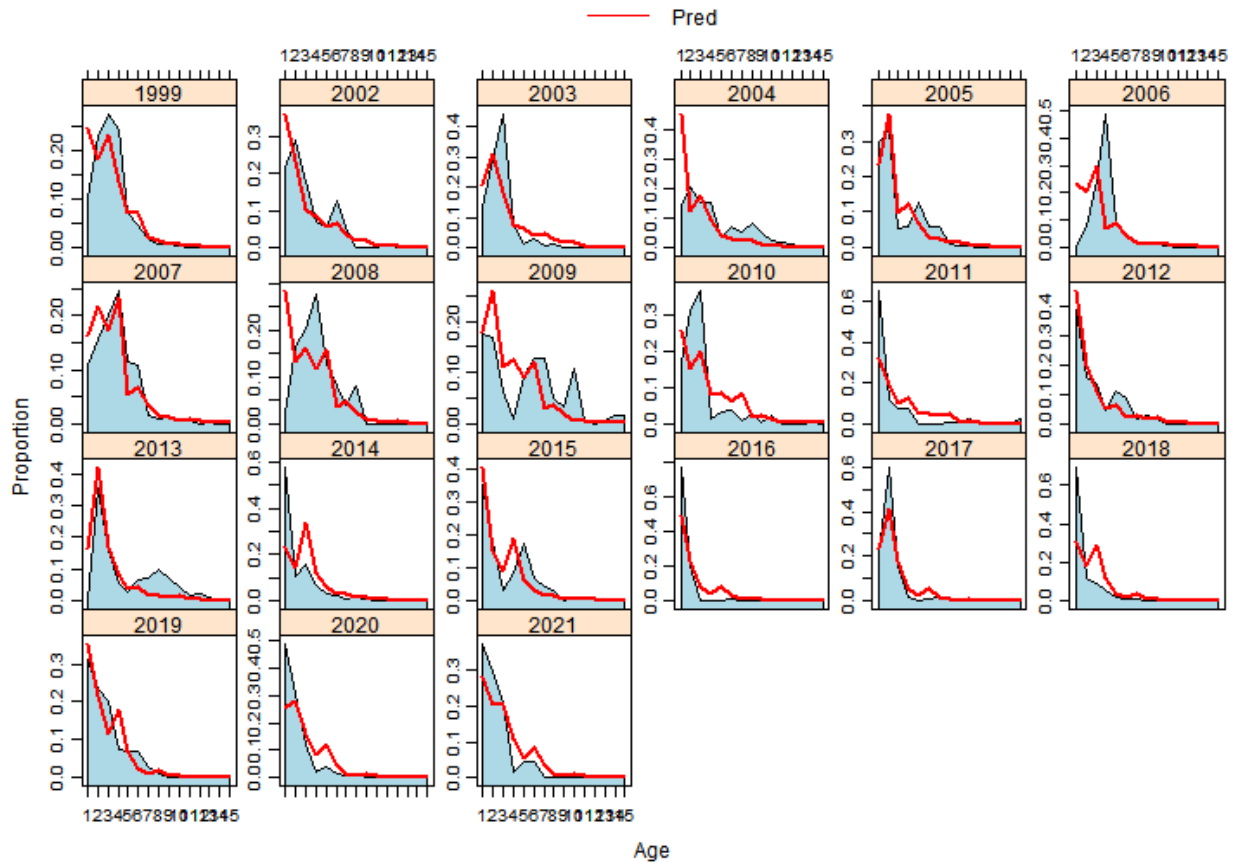


Draft for Board Review

DE30FT Age Composition By Age

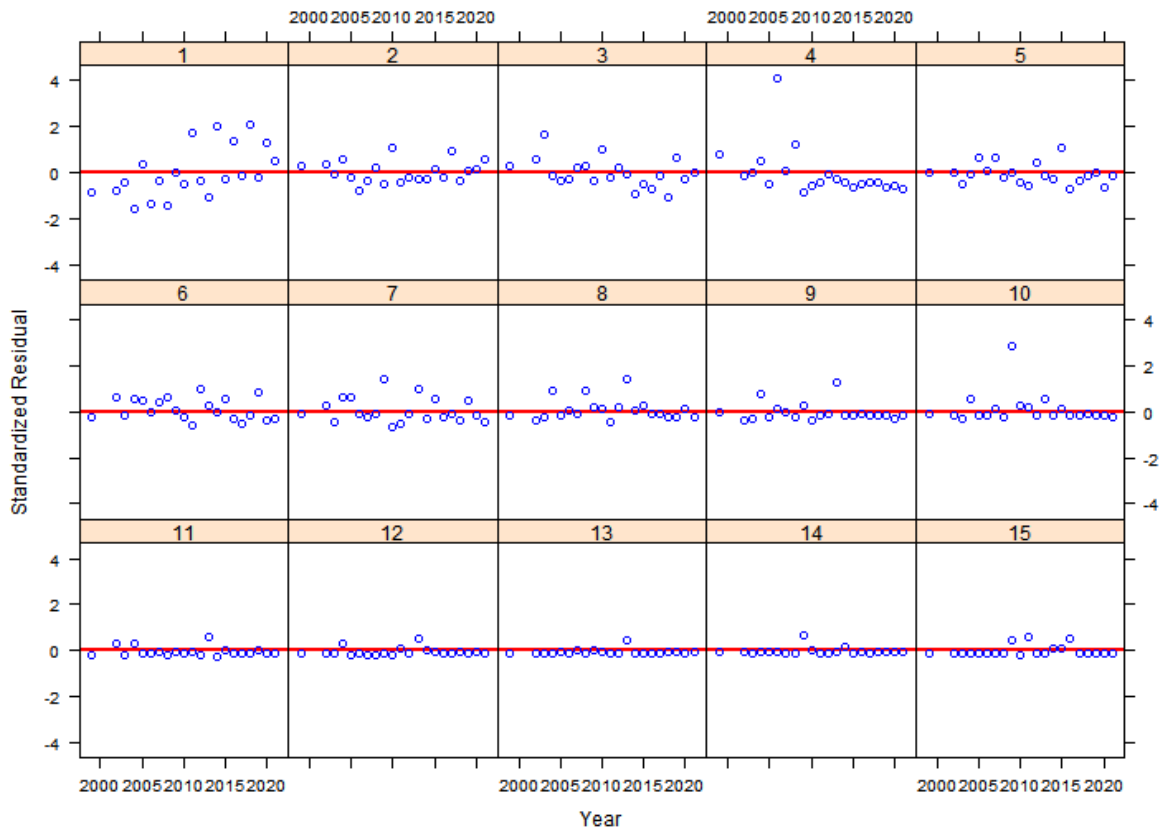


DE30FT Age Composition By Year

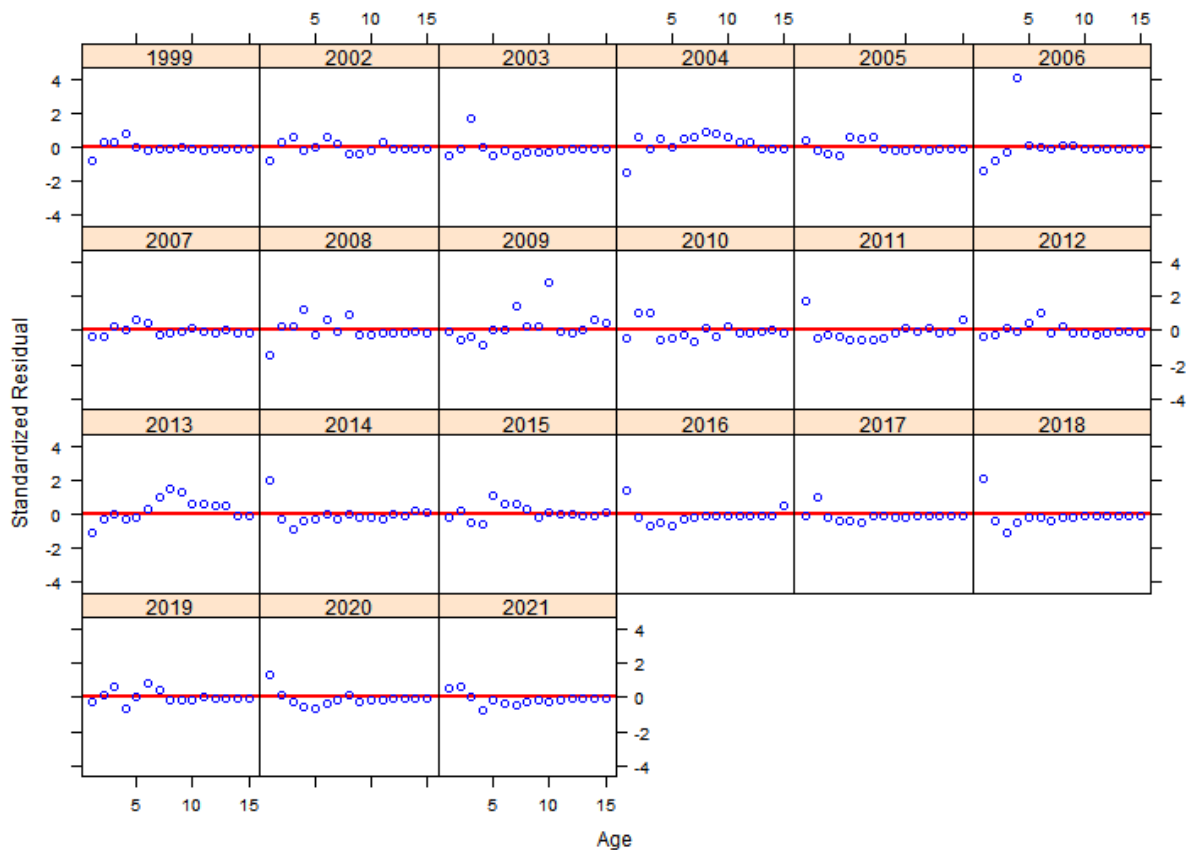


Draft for Board Review

DE30FT Age Residuals By Age

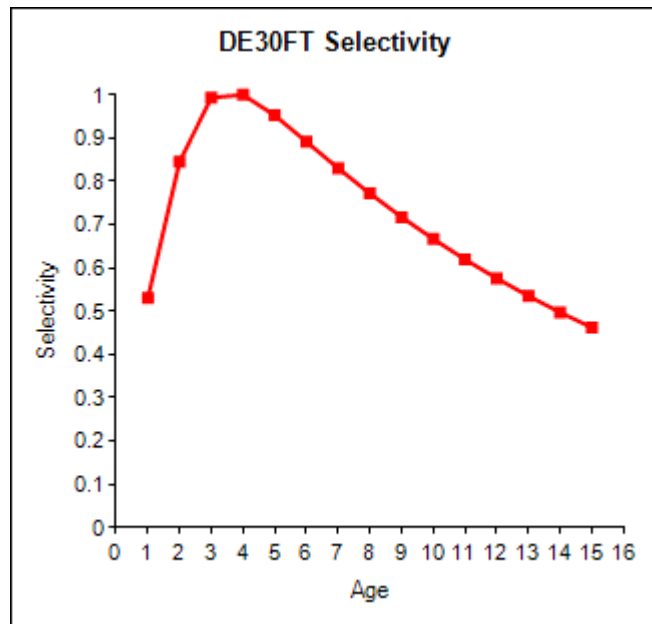
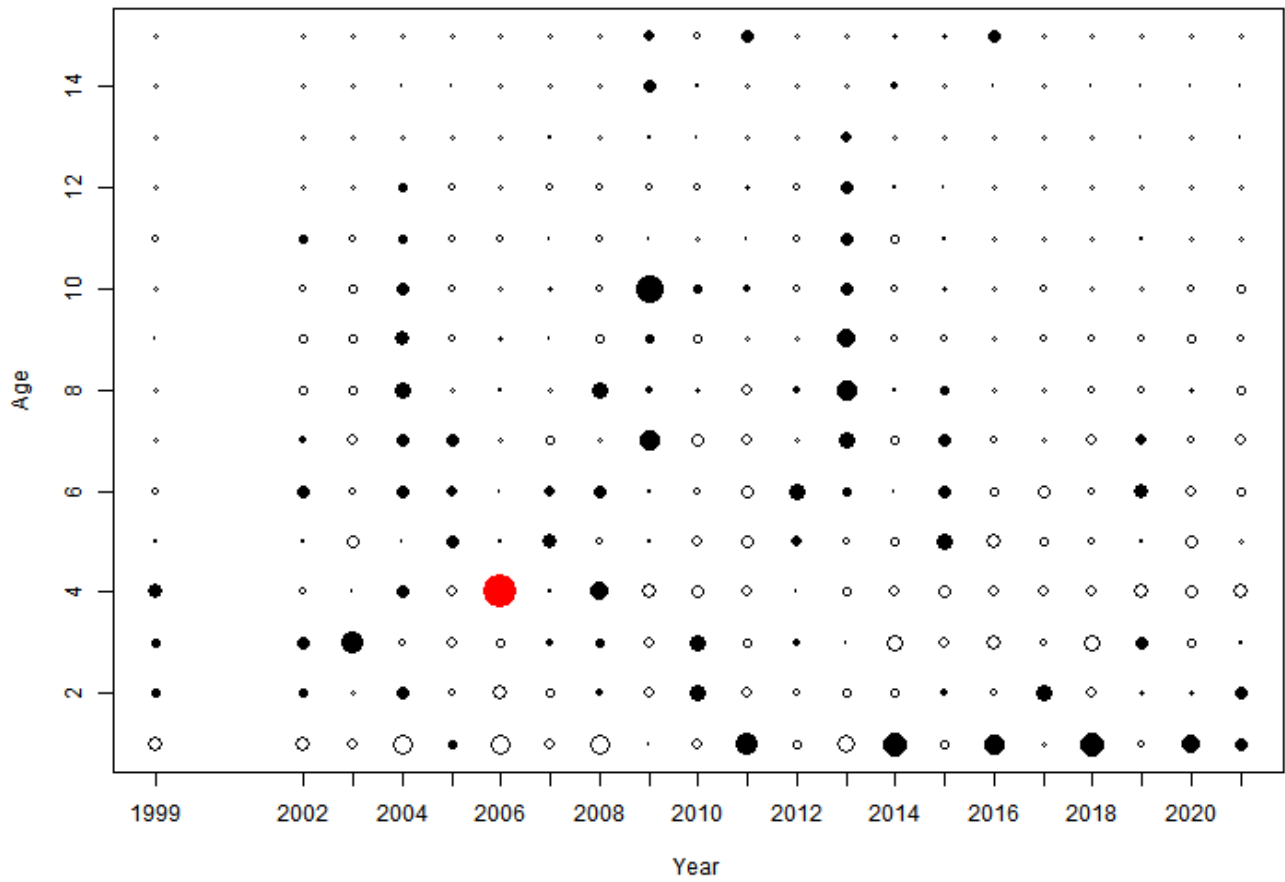


DE30FT Age Residuals By Year



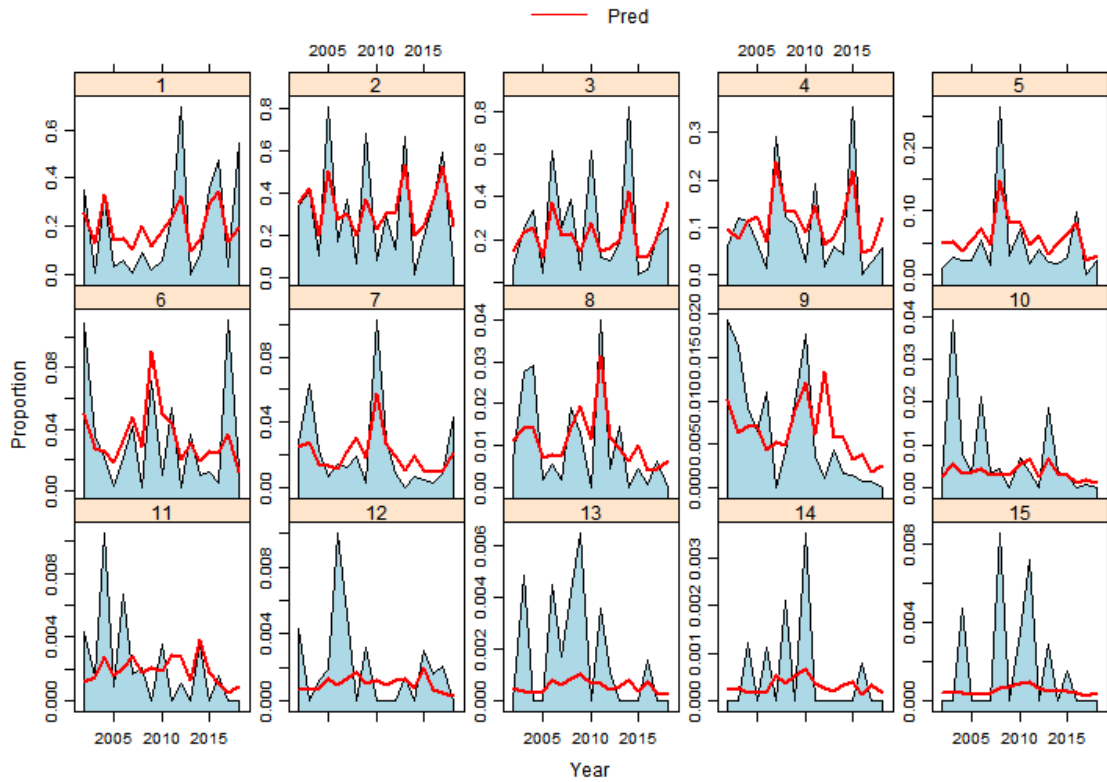
Draft for Board Review

DE30FT Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)

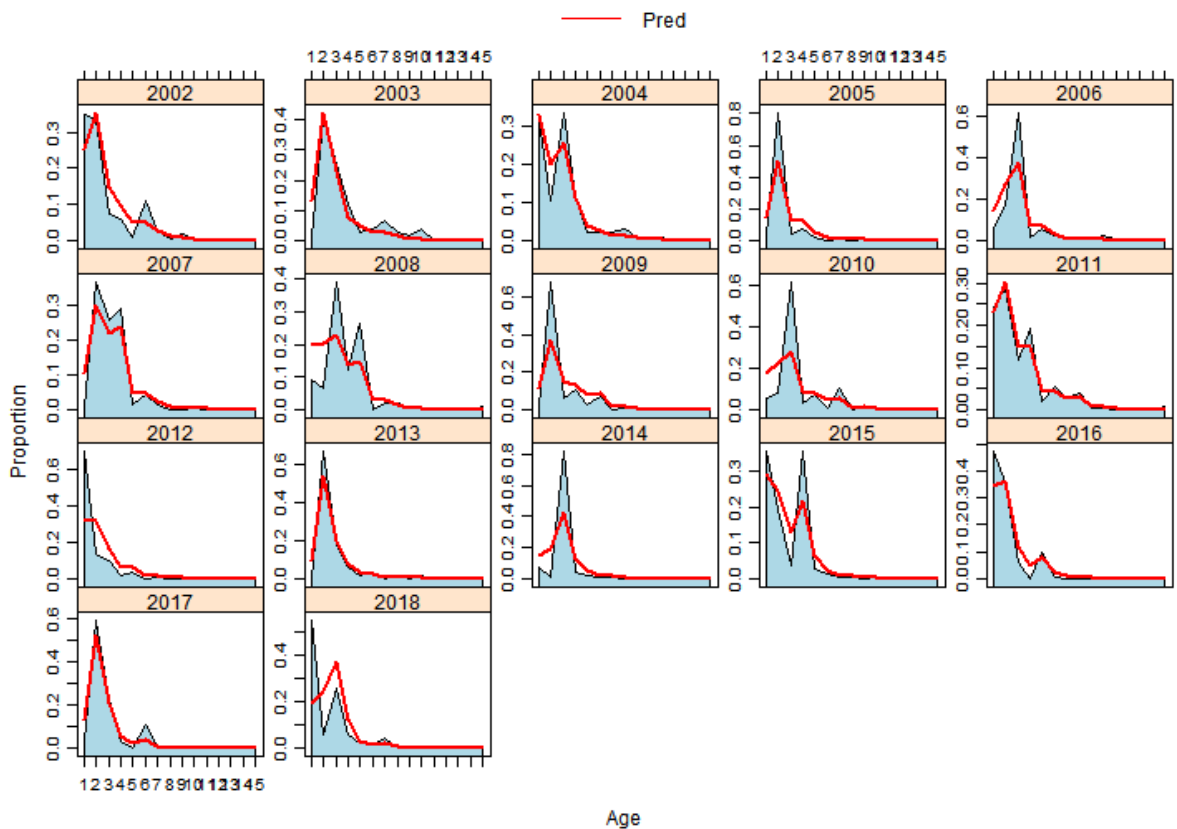


Draft for Board Review

CHESMAP Age Composition By Age

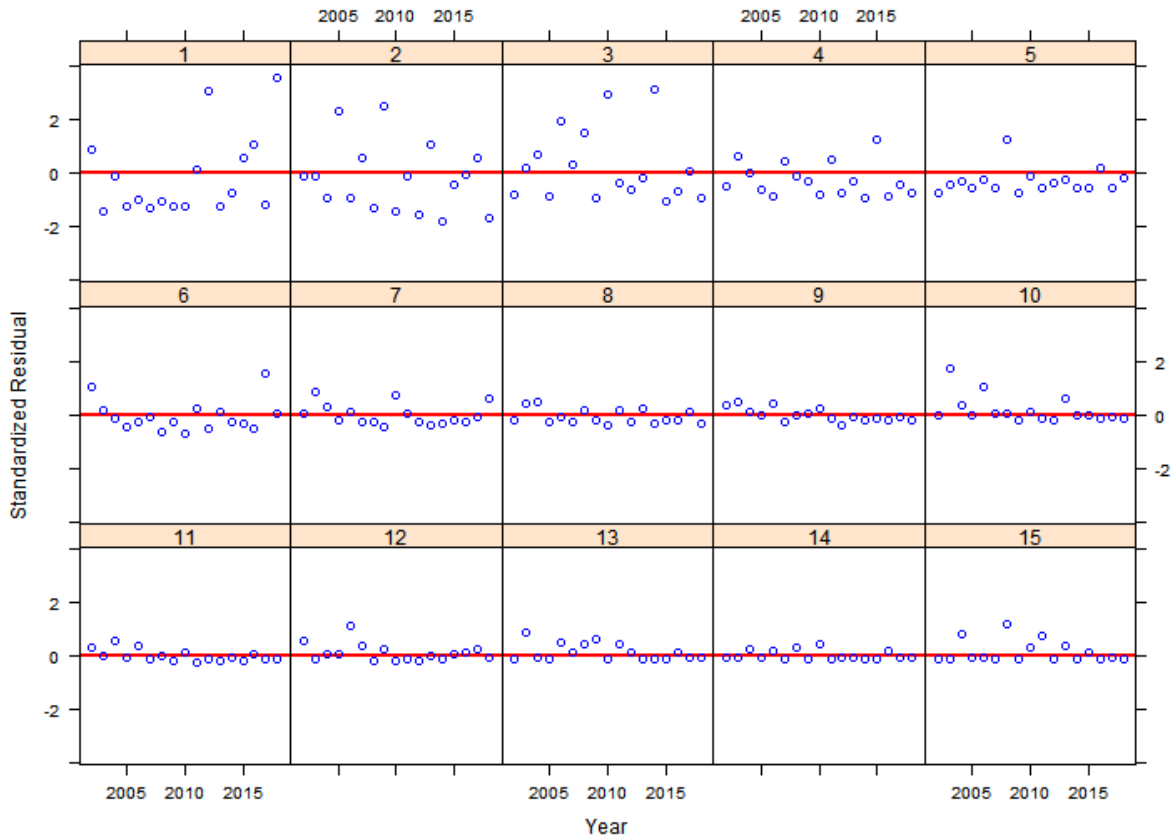


CHESMAP Age Composition By Year

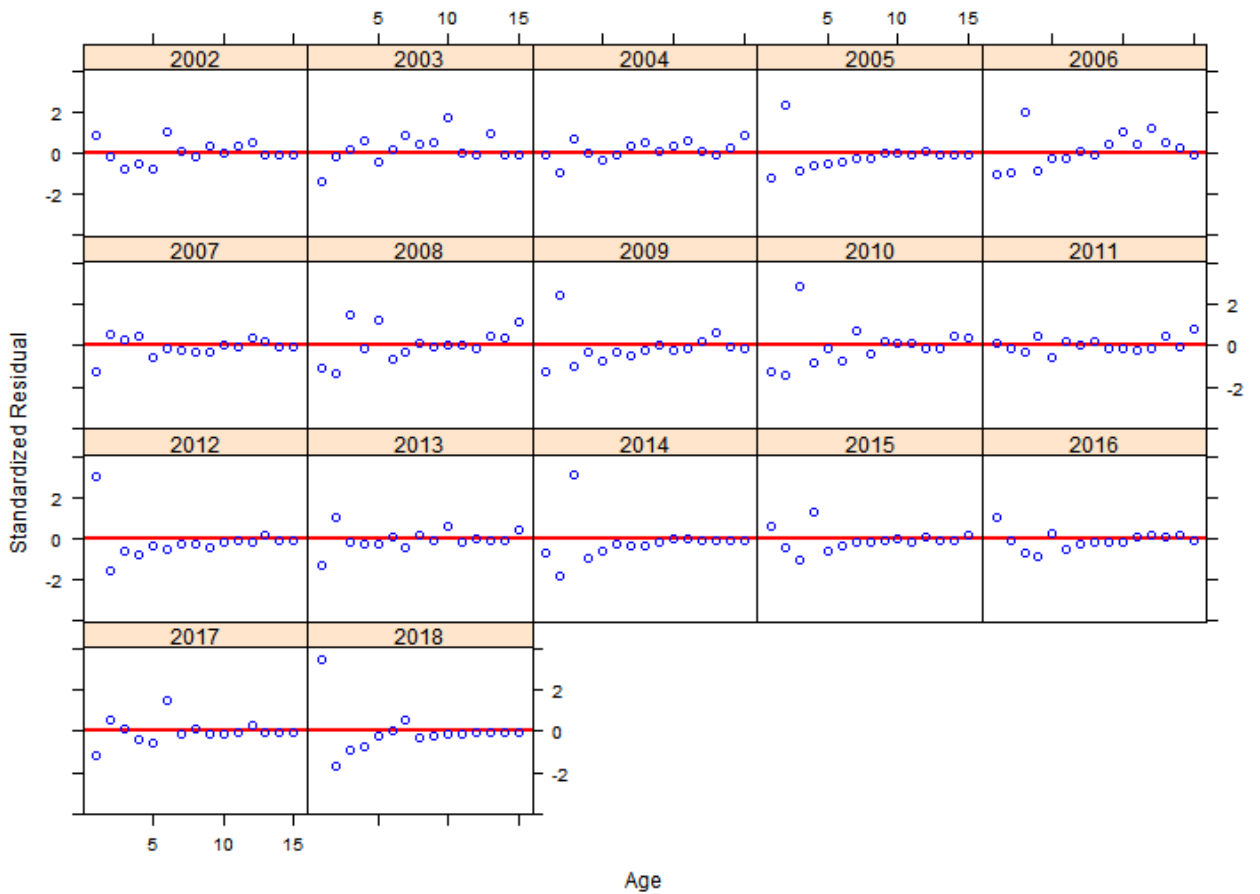


Draft for Board Review

CHESMAP Age Residuals By Age

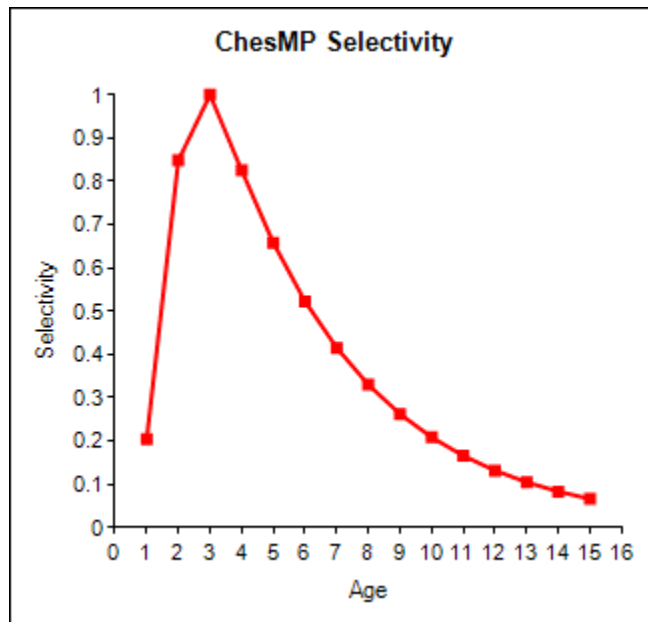
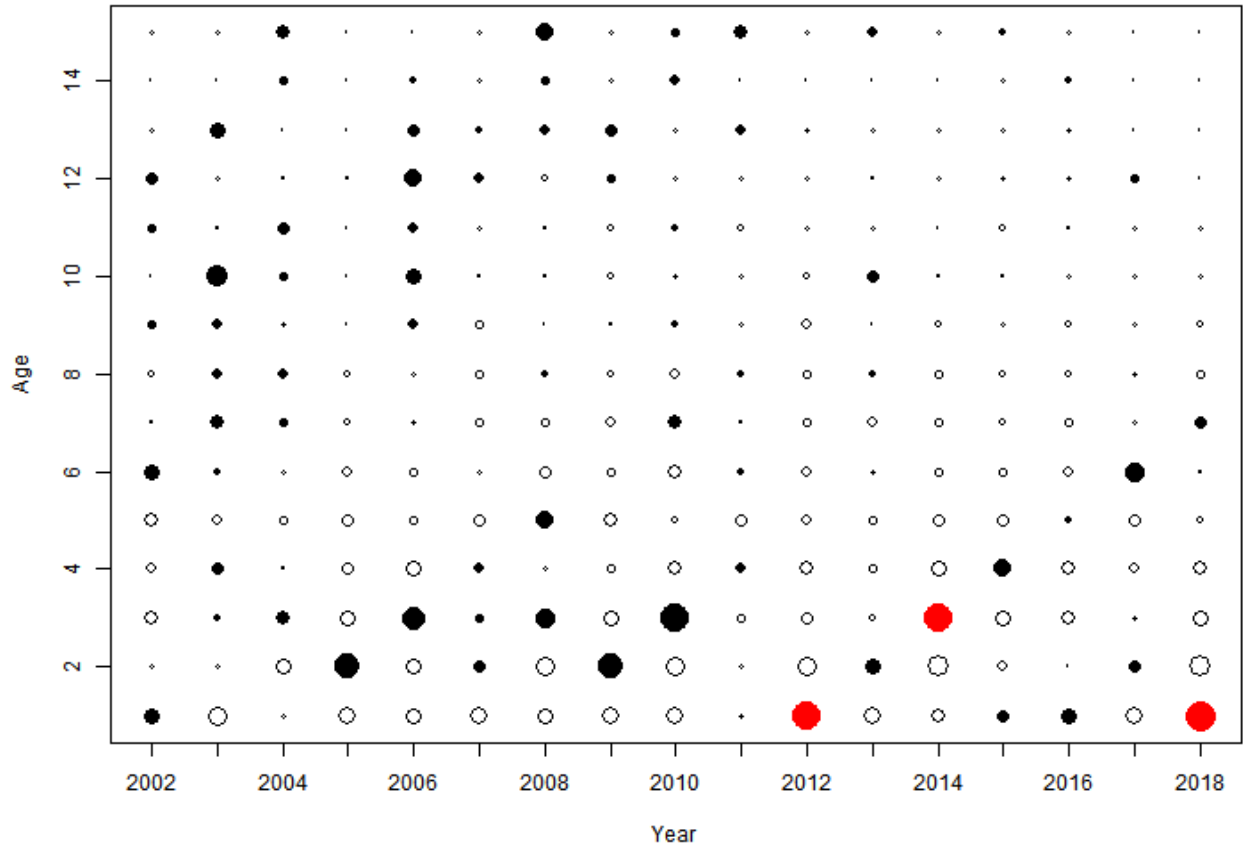


CHESMAP Age Residuals By Year



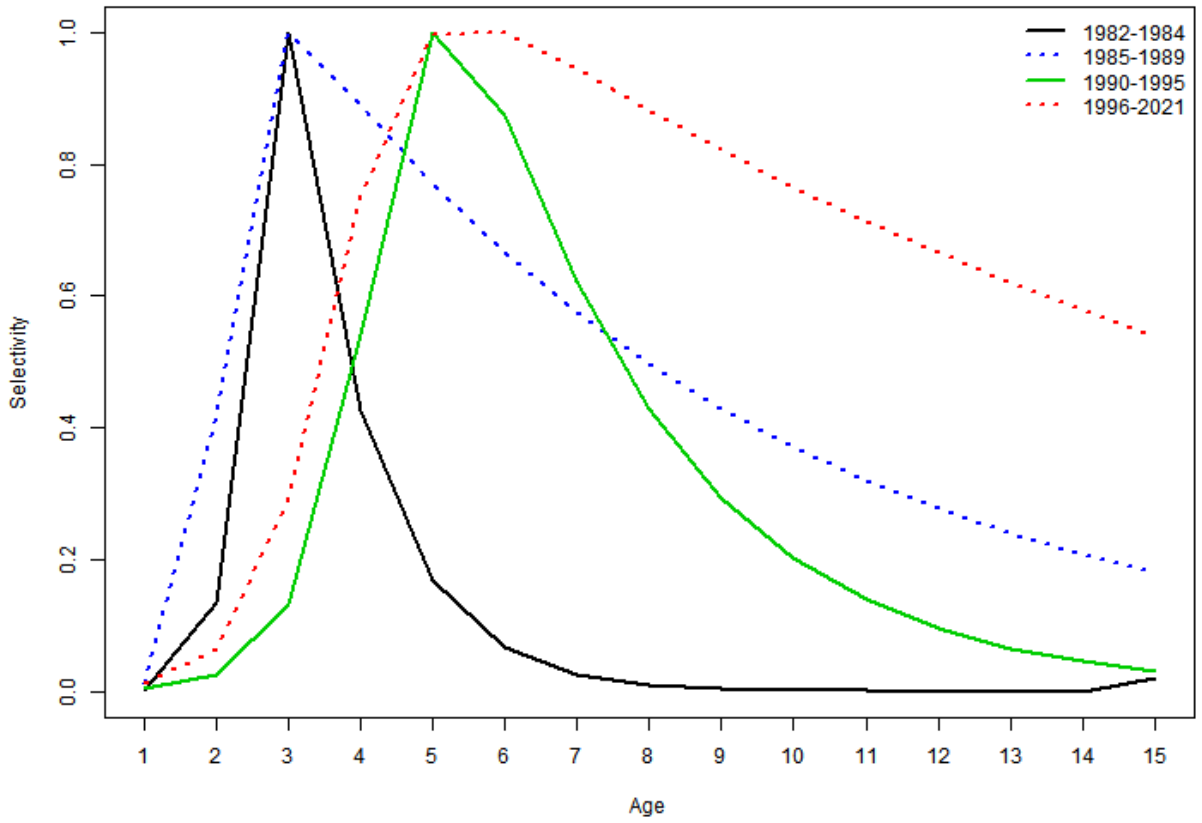
Draft for Board Review

CHESMAP Age Composition - Pearson Residuals (Solid = +, Hollow = -, Red > 3)

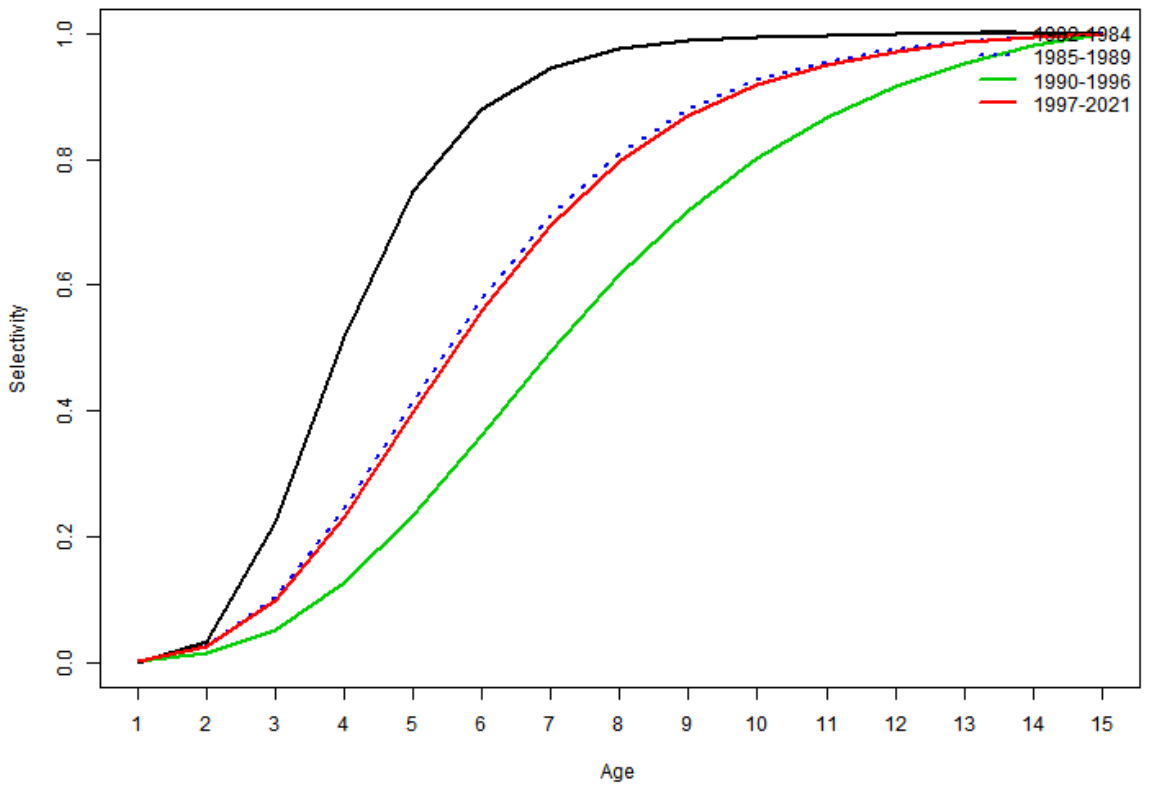


Draft for Board Review

Bay



Ocean



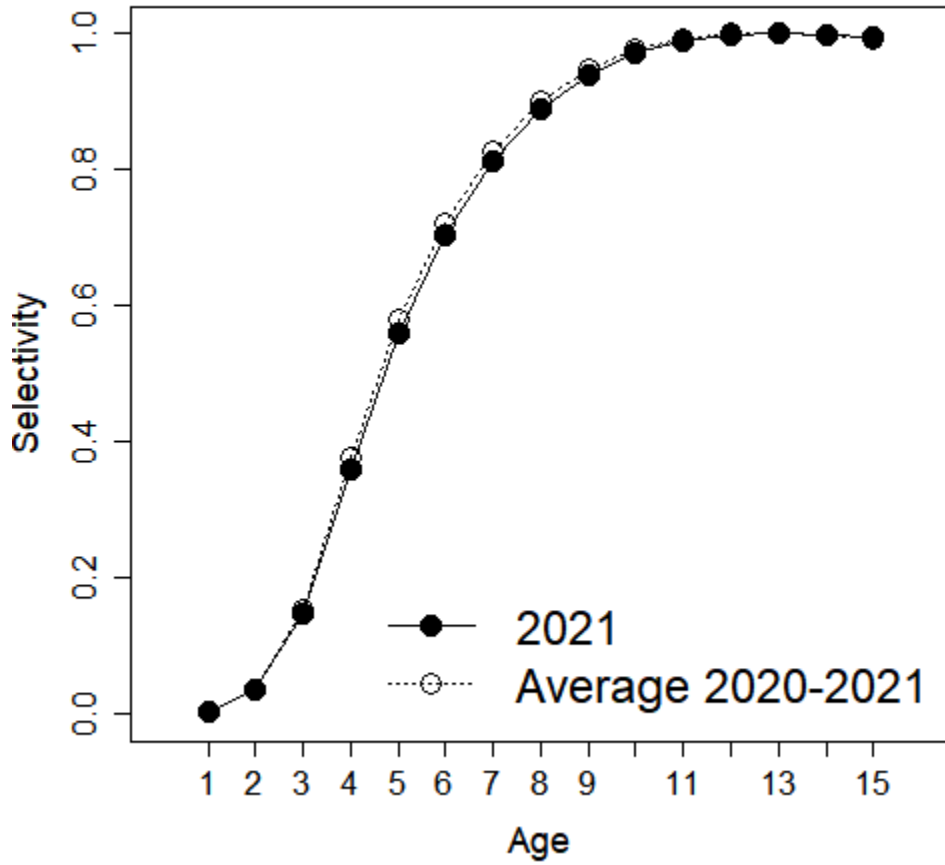
Draft for Board Review

	Likelihood Weight	RSS
Fleet 1 Total Catch:	2	0.222509
Fleet 2 Total Catch:	2	1.69769
Aggregate Abundance Indices		
NYYOY	1	28.2264
NJYOY	1	30.1896
MDYOY	1	10.0705
Compos	1	37.511
NYAge1	1	31.7116
MDAge1	1	24.2042
Age Comp Abundance Indices		
NYOHS	1	18.6369
NJTRAWL	1	20.626
MDSSN	1	30.6333
DESSN	1	21.6587
MRIP	1	35.7363
CTLIST	1	27.5067
DE30FT	1	17.2643
ChesMap	1	14.889
Total RSS		350.785
No. of Obs		517
Conc. Likel.		-100.264
Age Composition Data Likelihood		
Fleet 1 Age Comp:	1	4929.84
Fleet 2 Age Comp:	1	6138.57
NYOHS	1	728.002
NJTRAWL	1	310.785
MDSSN	1	1084.42
DESSN	1	984.378
MRIP	1	2625.57
CTLIST	1	819.882
DE30FT	1	240.59
ChesMap	1	401.496
Recr Devs :	1	41.7836
Total Likelihood :		18136
AIC :		36644

Draft for Board Review

Index	n	RMSE	CV Weight	Effective Sample Size
NYYOY	36	0.993619	2.95	
NJYOY	38	1.00437	1.75	
MDYOY	12	0.99145	2.09	
compos	40	0.992974	0.99	
NYAge1	37	0.99486	1.21	
MDAge1	52	0.992657	3.22	
NYOHS	20	0.990824	2.60	21.88
NJTRAWL	29	1.00158	2.95	5.70
MDSSN	37	0.990333	2.50	14.33
DESSN	24	0.995435	1.16	17.81
MRIP	40	1.00725	2.31	30.68
CTLIST	34	1.00434	3.00	12.99
DE3OFT	21	1.00074	0.85	6.09
ChesMP	17	1.00582	2.47	15.26

No New Selectivity Blocks Selectivities for Projection



Draft for Board Review

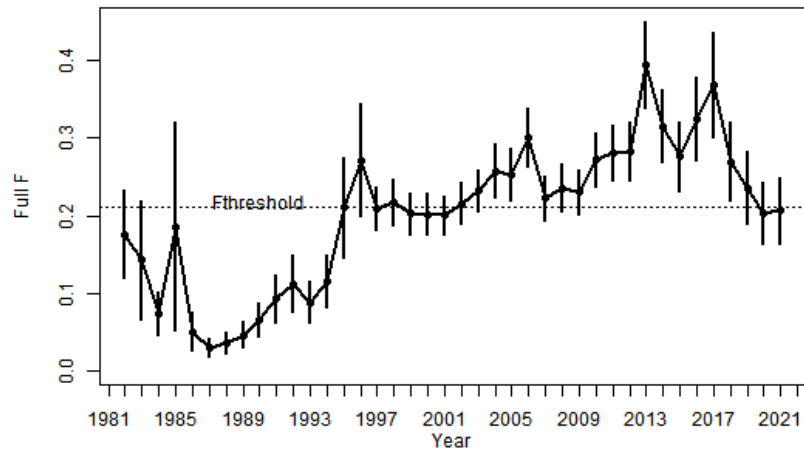
SSBthreshold=86016.6;Fthreshold=0.2120

SSBtarget=107520.7;Ftarget=0.1727

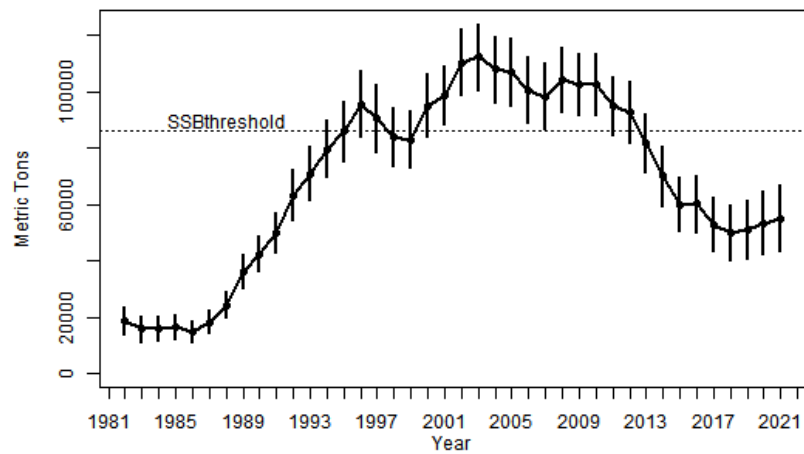
Fcurrent=0.2069

Estimates with 95% Confidence Intervals

Fully-recruited Fishing Mortality



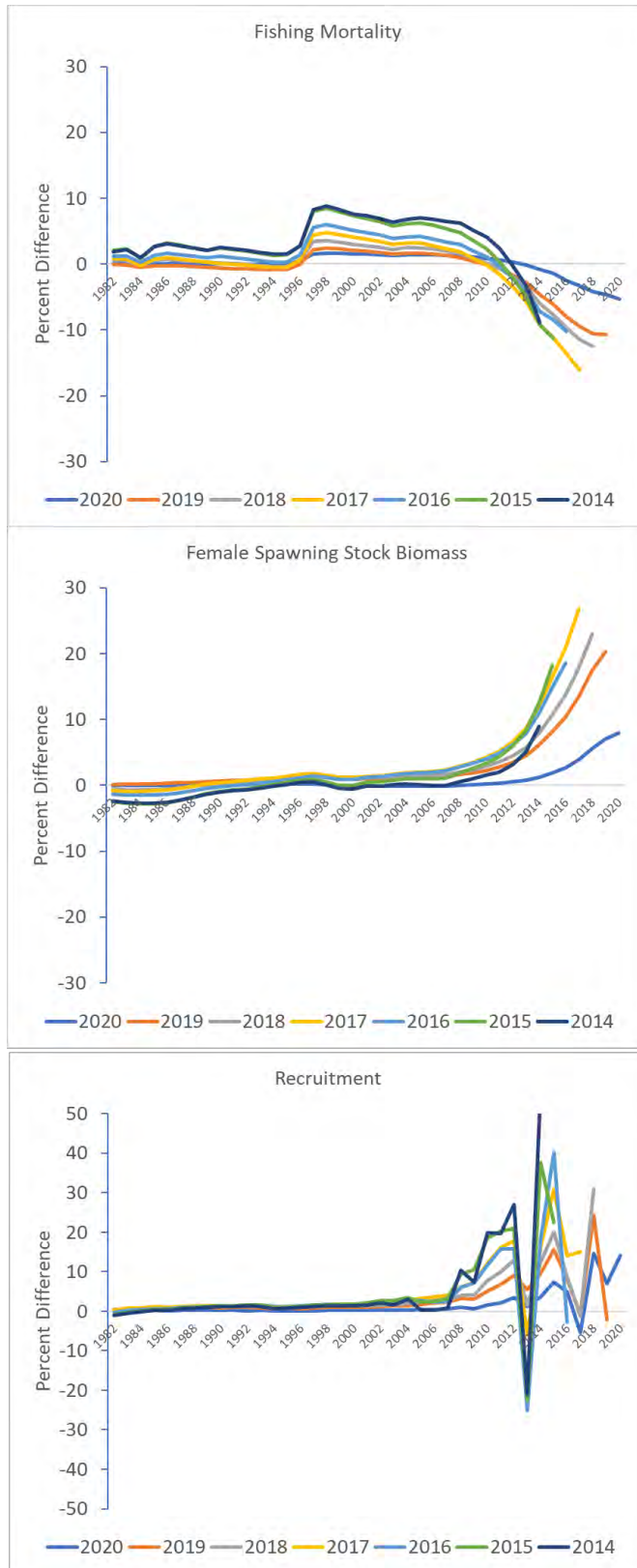
Female Spawning Stock Biomass



Draft for Board Review

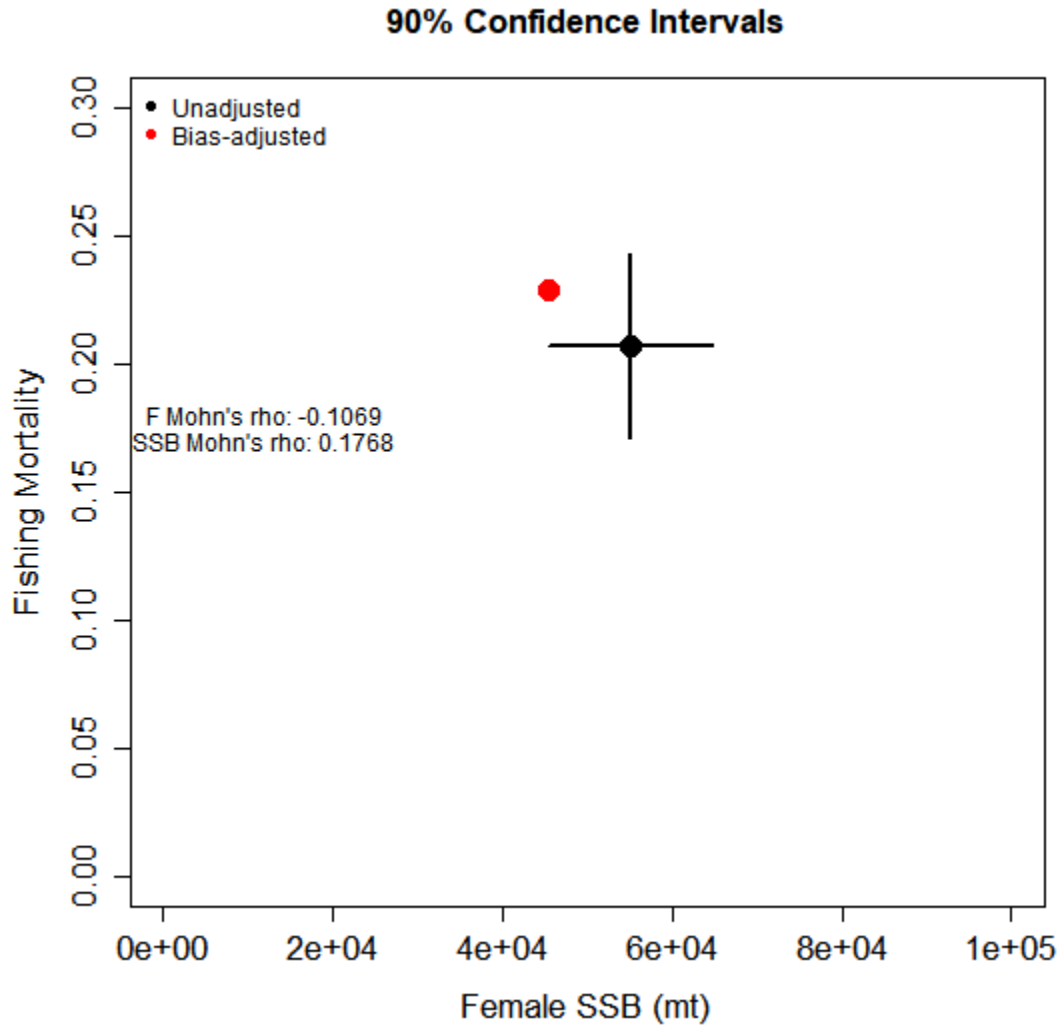
Draft for Board Review

Number of peels = 7 (NMFS standard)



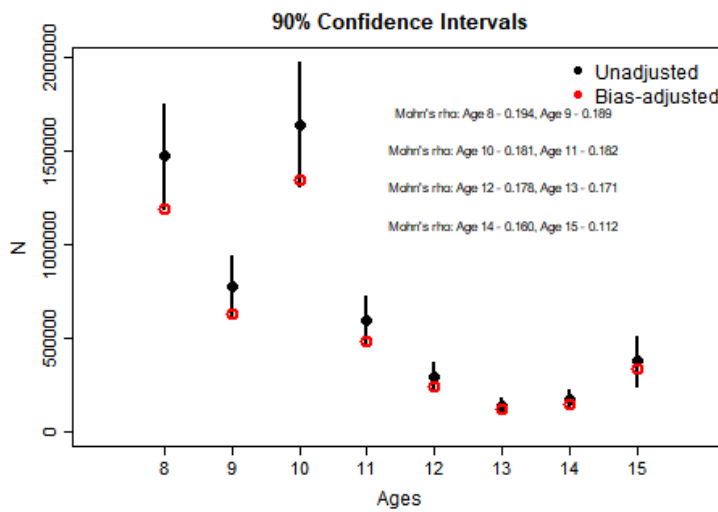
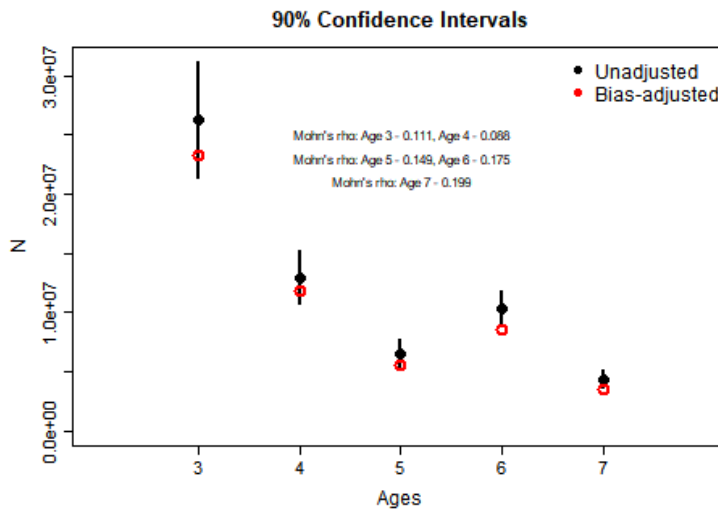
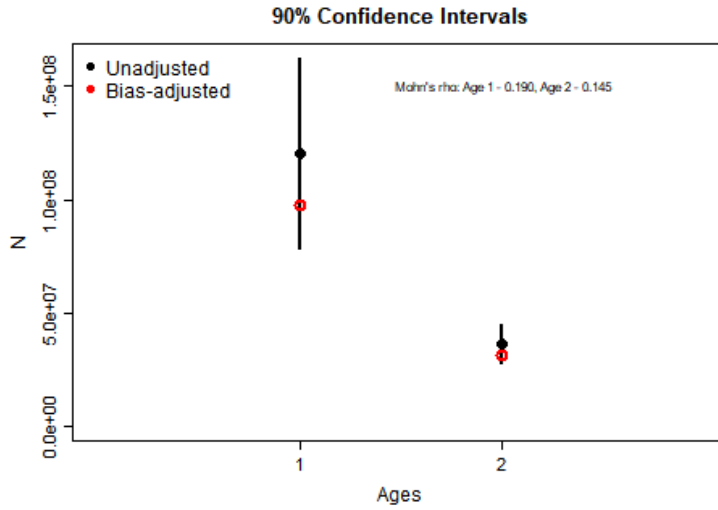
Draft for Board Review

Retrospective Bias corrected values just barely within 90% confidence intervals of original values; no bias-correction required.



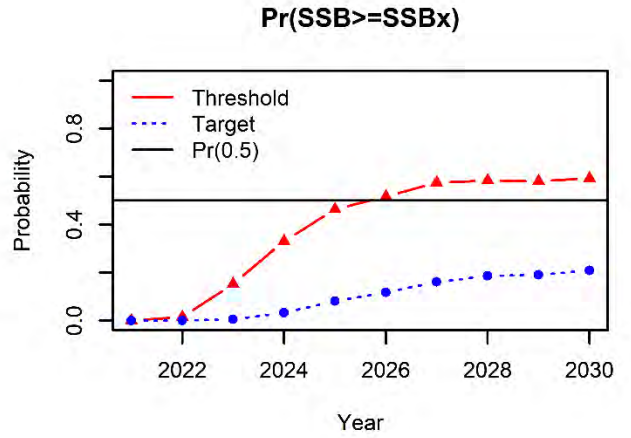
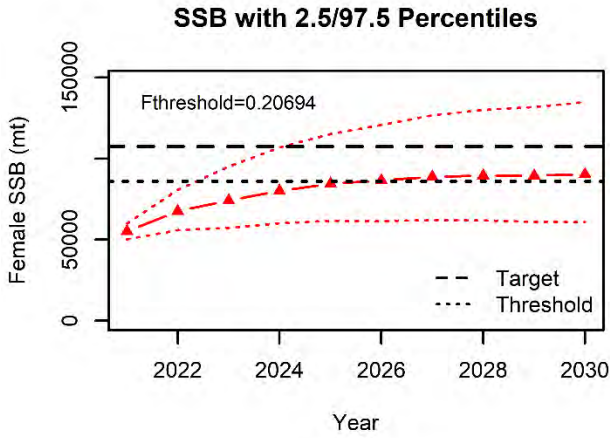
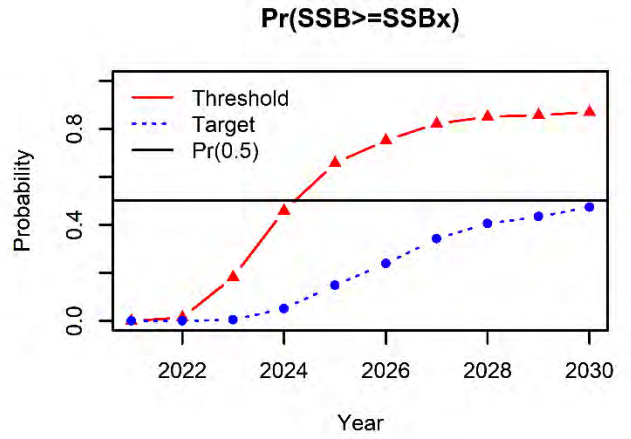
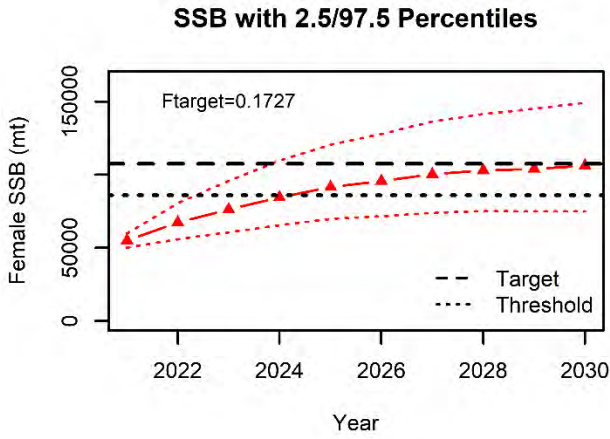
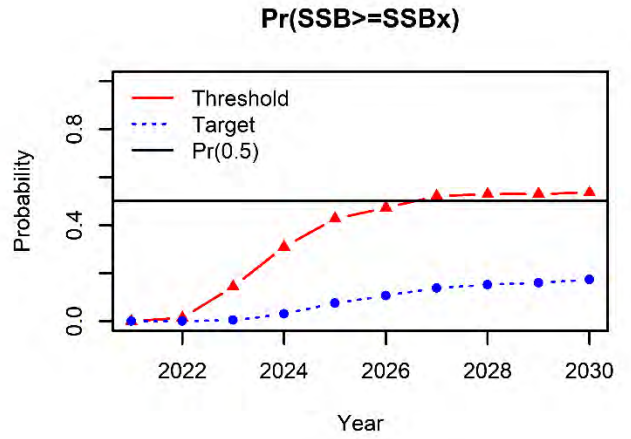
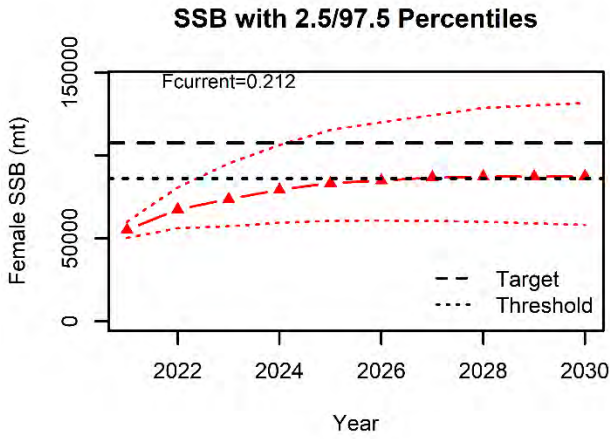
Draft for Board Review

Only 2 retrospective values outside 90% Cis of original values



Draft for Board Review

SSBtarget not reached by 2029 under current fishing mortality but it is reached by 2030 under Ftarget



Draft for Board Review

Because SSBtarget will not be reached by 2029 under current F, how much should removals be reduced.

Not Bias-Corrected

Catch = 4700757; $F_{2029}=0.162$

%Reduction from current:

$$(4,700,757-5,144,534)/5,144,534*100 = -8.6\%$$



Atlantic States Marine Fisheries Commission

1050 N. Highland Street • Suite 200A-N • Arlington, VA 22201
703.842.0740 • 703.842.0741 (fax) • www.asmf.org

MEMORANDUM

October 12, 2022

To: Atlantic Striped Bass Management Board
From: Tina Berger, Director of Communications
RE: Advisory Panel Nomination

Please find attached a nomination to the Atlantic Striped Bass Advisory Panel – Craig Poosikian, a commercial rod and reel fishermen from Massachusetts. Please review this nomination for action at the next Board meeting.

If you have any questions, please feel free to contact me at (703) 842-0749 or tberger@asmfc.org.

Enc.

cc: Emilie Franke

M22-101

Atlantic Striped Bass Advisory Panel

Maine

David Pecci (rec)
144 Whiskeag Road
Bath, ME 04530

Phone (o): (207) 442-8581
Phone (c): (207) 841-1444
FAX: (207) 442-8581
dave@obsessioncharters.com
Appt. Confirmed 5/23/02
Appt Reconfirmed 5/10

Bob Humphrey (comm. rod and reel/for-hire)
727 Poland Range Road
Pownal, ME 04069
Phone (day): 207.688.4966
Phone (eve): 207.688.4854
bob@bobhumphrey.com
Appt. Confirmed 2/18/20

New Hampshire

Peter Whelan (rec)
100 Gates Street
Portsmouth, NH 03801
Phone (o): (603) 205-5318
Phone (h): (603) 427-0401
pawhelan@comcast.net
Appt. Confirmed 2/24/03
Appt Reconfirmed 5/10

Massachusetts

Douglas M. Amorello (comm. rod & reel)
68 Standish Street
Pembroke, MA 02359
Cell: (774)766-8781
sashamysportfishing@gmail.com
Appt. Confirmed 3/23/11
Appt. Reconfirmed 8/18

Patrick Paquette (rec/for-hire/comm)
61 Maple Street
Hyannis, MA 02601
Phone: (781)771.8374
Email: basicpatrick@aol.com
Appt. Confirmed 8/16

Rhode Island

Andrew J. Dangelo (for-hire)
1035 Liberty Lane
West Kingston, RI 02892
Phone: 401.788.6012
Maridee2@gmail.com
Appt. Confirmed 2/3/21

Michael Plaia (comm/rec/for-hire)
119 Currituck Road
Newtown, CT 06470
Phone: 203.512.4280
Makomike3333@yahoo.com
Appt. Confirmed 2/3/21

Craig Poosikian (comm. rod & reel)
19 Giddah Hill Road
PO Box 1878
Orleans, MA 02653
Phone: 508.240.2345
bhge@gmail.com

Connecticut

Kyle Douton (rec/tackle shop owner)
5 Rockwell Street
Niantic, CT 06357
Phone (day): (860)739-7419
Phone (eve): (860)739-8899
FAX: (860)739-9208
kyle@jbtackle.com
Appt. Confirmed 5/13/14

Vacancy (rec)

New York

Bob Danielson (rec)
86 Balin Avenue
South Setauket, NY 11720
Phone: 631.974.8774
Bdan93@optonline.net
Appt. Confirmed 10/22/20

Vacancy (comm)

New Jersey

C. Louis Bassano, Chair
1725 West Central Avenue
Ortley Beach, New Jersey 08751

Atlantic Striped Bass Advisory Panel

Phone (c): (908) 241-4852
FAX: (908) 241-6628
lbassano@comcast.net
Appt. Confirmed 10/15/01
Appt. Reconfirmed 2/9/06; 5/17/10; 4/14/14

Eleanor A. Bochenek (retired fisheries scientists with experience in Mid-Atlantic rec. and comm fisheries)
117 Alexander Avenue
Villas, NJ 08251
Phone: (609) 425.0686
eboch@hsrl.rutgers.edu
Appt. Confirmed 11/5/21

Pennsylvania ***Vacancy (rec)***

Delaware

Leonard Voss, Jr. (com)
2854 Big Oak Road
Smyrna, DE 19977
Phone: (302) 653-7999
Appt. Confirmed 4/21/94
Appt. Reconfirmed 7/27/99; 7/03 and 7/07

Steven Smith (rec)
59 Burnham Lane
Dover, DE 19901
Phone (day): (302)744-9140
Phone (eve): (302)674-5186
smithbait@verizon.net
Appt. Confirmed 10/23/18

Maryland

Chris Dollar (outdoor columnist and fishing guide)
PO Box 367
Queenstown, MD 21658
Phone: 410.991.8486
cdollarchesapeake@gmail.com
Appt. Confirmed 8/3/21

Charles E. Green Jr. (for –hire)
7327 Woodshire Avenue
Chesapeake Beach, MD 20732
Phone: 301.233.0377
greeneddie@verizon.net

Appt. Confirmed 8/3/21

Virginia

Vice-Chair - Kelly Place (comm; reappted chair 10/2010)
213 Waller Mill Road
Williamsburg, VA 23185
Phone (h): (757) 220-8801
Phone (c): (757) 897-1009
FAX: (757) 259-9669
kelltron@aol.com
Appt. Confirmed 5/23/02
Appt Reconfirmed 5/06 and 5/10

William Edward Hall Jr. (rec)
PO Box 235
26367 Shoremain Drive
Bloxom, VA 23308
Phone (day): (757)854-1519
Phone (eve): (757)894-0416
FAX: (757)854-0698
esangler@verizon.net
Appt. Confirmed 5/13/14

North Carolina

Jon Worthington (rec)
405 Japonica Drive
Camden, NC 27921
Phone: (252) 562-2914
ncpierrat@gmail.com
Appt Confirmed 5/5/21

Jamie Lane (estuarine and ocean gillnetter)
602 South Main Street
Robersonville, NC 27871
Phone: (252) 312-6832
Jlwinsl3@ncsu.edu
Appt Confirmed 5/4/22

District of Columbia

Joe Fletcher (rec)
1445 Pathfinder Lane
McLean, VA 22101
Phone: (703) 356-9106
Email: jmfletcher@verizon.net
Appt. Confirmed 10/30/95
Appt. Reconfirmed 9/15/99; 9/03 and 9/07

Atlantic Striped Bass Advisory Panel

Potomac Fisheries River Comm.

Dennis Fleming (fishing guide; seafood processor/dealer)

P.O. Box 283

Newburg, MD 20664

Phone: 240.538.1260

captaindennisf@gmail.com

Appt. Confirmed 2/3/21



ATLANTIC STATES MARINE FISHERIES COMMISSION

Advisory Panel Nomination Form

This form is designed to help nominate Advisors to the Commission's Species Advisory Panels. The information on the returned form will be provided to the Commission's relevant species management board or section. Please answer the questions in the categories (All Nominees, Commercial Fisherman, Charter/Headboat Captain, Recreational Fisherman, Dealer/Processor, or Other Interested Parties) that pertain to the nominee's experience. If the nominee fits into more than one category, answer the questions for all categories that fit the situation. **Also, please fill in the sections which pertain to All Nominees (pages 1 and 2).** In addition, nominee signatures are required to verify the provided information (page 4), and Commissioner signatures are requested to verify Commissioner consensus (page 4). Please print and use a black pen.

Form submitted by: Raymond Kane State: MA
(your name)

Name of Nominee: Craig Poosikian

Address: 19 Giddiah Hill Rd. PO Box 1878

City, State, Zip: Orleans, Ma. 02653

Please provide the appropriate numbers where the nominee can be reached:

Phone (day): 508-240-2345 Phone (evening): same

FAX: _____ Email: bhge@ymail.com

FOR ALL NOMINEES:

1. Please list, in order of preference, the Advisory Panel for which you are nominating the above person.

1. Striped Bass
2. _____
3. _____
4. _____

2. Has the nominee been found in violation of criminal or civil federal fishery law or regulation or convicted of any felony or crime over the last three years?

yes _____ no X

3. Is the nominee a member of any fishermen's organizations or clubs?

yes X no _____

If "yes," please list them below by name.

Nauset Rod & Gun Club

4. What kinds (species) of fish and/or shellfish has the nominee fished for during the past year?

striped bass, bluefish

oyster, quahog, razor clam

sea bass, fluke

sea worm, squid

bonito, false albacore

5. What kinds (species) of fish and/or shellfish has the nominee fished for in the past?

all of the above, plus

tautog, flounders, and more

(If it crawls or swims, I have spent time catching it)

FOR COMMERCIAL FISHERMEN:

1. How many years has the nominee been the commercial fishing business? 41 years

2. Is the nominee employed only in commercial fishing? yes _____ no X

3. What is the predominant gear type used by the nominee? rod & reel, hand rakes

4. What is the predominant geographic area fished by the nominee (i.e., inshore, offshore)? inshore

FOR CHARTER/HEADBOAT CAPTAINS:

1. How long has the nominee been employed in the charter/headboat business? _____ years

2. Is the nominee employed only in the charter/headboat industry? yes _____ no _____

If "no," please list other type(s) of business(es) and/occupation(s): _____

3. How many years has the nominee lived in the home port community? _____ years

If less than five years, please indicate the nominee's previous home port community.

FOR RECREATIONAL FISHERMEN:

1. How long has the nominee engaged in recreational fishing? 60 years

2. Is the nominee working, or has the nominee ever worked in any area related to the fishing industry? yes x no _____

If "yes," please explain.

commercial harvester, aquaculturist (primarily oyster), reel repair for local tackle shop

SHELLFISH, FINFISH, CHARTER (MATE), CATERING (RAW BAR/ CLAMBAKE), DIG SEAWALMS

FOR SEAFOOD PROCESSORS & DEALERS:

1. How long has the nominee been employed in the business of seafood processing/dealing? _____ years

2. Is the nominee employed only in the business of seafood processing/dealing?

yes _____ no _____ If "no," please list other type(s) of business(es) and/or occupation(s):

3. How many years has the nominee lived in the home port community? _____ years

If less than five years, please indicate the nominee's previous home port community.

FOR OTHER INTERESTED PARTIES:

1. How long has the nominee been interested in fishing and/or fisheries management? _____ years

2. Is the nominee employed in the fishing business or the field of fisheries management?

yes _____ no _____

If "no," please list other type(s) of business(es) and/or occupation(s):

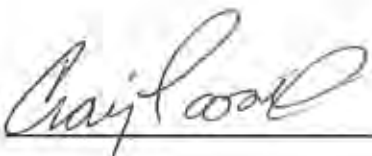
FOR ALL NOMINEES:

In the space provided below, please provide the Commission with any additional information which you feel would assist us in making choosing new Advisors. You may use as many pages as needed.

I started fishing when I was three years old. I have been fully immersed in the sport since then to the point that I build rods, repair reels and build my own terminal tackle. I sold my first striped bass in 1981 and I was hooked! I'm not a high liner by any means and I don't want to be; I enjoy fishing for stripers and if they are commercially viable I take them to market. I blew up the engine on my boat two years ago but I still fish from shore looking to make my sales.

I sat on the Board of Directors of the Cape Cod Commercial Hook Fishermen's Assoc. for five years. I am the Executive Officer (board position) of Nauset Rod and Gun Club in Eastham and have held that position for approximately 10 years. For the past seven years, I have sat on the Orleans Shellfish and Waterways Advisory Committee (Secretary for past two years).

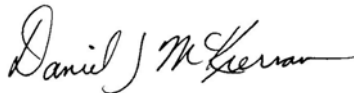
For work I do home construction, bend sheet metal (primarily copper), reel repair at the local tackle shop and I have an aquaculture site (one acre) in Eastham where I focus on growing oysters, though other species have come and gone.

Nominee Signature: 

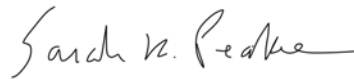
Date: ~~7/27/22~~
10/4/22

Name: Craig Poosikian
(please print)

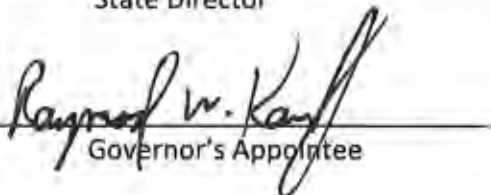
COMMISSIONERS SIGN-OFF (not required for non-traditional stakeholders)



State Director



State Legislator


Governor's Appointee

From: [Robert Beal](#)
Sent: Wednesday, October 12, 2022 9:23 AM
To: [Emilie Franke](#)
Subject: FW: [External] Striped Bass fishery currently worse than it was in 1985

Good Morning Emilie,

I received the following comments this morning. Please add to the public comment for the November meeting.

Thanks,
Bob

From: tim johnson <ballalldaysports@gmail.com>
Sent: Wednesday, October 12, 2022 12:48 AM
To: Robert Beal <Rbeal@asmfc.org>
Subject: [External] Striped Bass fishery currently worse than it was in 1985

Hello Mr.Beal I have been on the water a lot this year all over new england and have now ended my season and going back to my home in Delaware now and have spoken to many other recreational and commercial fisherman who are very experienced and we are all coming to the same conclusion, the striped bass fishery has come to a collapse that is worse than the early 80s.

I honestly believe sir that it is time to shut down this fishery and give these fish game fish status and recommend that Congress invest money in environmental police to combat poaching as well.

To put it bluntly this fishery is absolutely screwed at this time and commercial and recreational stress along with many other factors such as large seal colonies, poachers and low spawn rates I fear that this fishery could collapse at any given year very soon. Also I cannot believe how many poachers I saw killing small fish this year guys having trash bags filled with 16-25" fish it is disgusting what is going on out on the ground. Never have I seen so much bait with no big bass slamming on them during the fall migration we are concerned very concerned even 1985 was better than what we saw this year it is bad hope you guys recover this fishery it would be a shame if these kids cant have the experiences we had in the 70s wow those were good times God bless

Atlantic States Marine Fisheries Commission

Shad and River Herring Management Board

November 8, 2022

9:00 – 10:30 a.m.

Hybrid Meeting

Draft Agenda

The times listed are approximate; the order in which these items will be taken is subject to change; other items may be added as necessary.

1. Welcome/Call to Order (*J. Davis*) 9:00 a.m.
2. Board Consent 9:00 a.m.
 - Approval of Agenda
 - Approval of Proceedings from May 2022
3. Public Comment 9:05 a.m.
4. Consider American Shad Habitat Plan Update (*B. Neilan*) **Action** 9:15 a.m.
 - Massachusetts Taunton River Addition
5. Consider Approval of River Herring Sustainable Fishery Management Plan (SFMP) Updates (*B. Neilan*) **Final Action** 9:30 a.m.
 - Massachusetts Nemasket River Update and Herring River Addition
 - Maine SFMP Addendum
6. Update on the 2023 River Herring Benchmark Stock Assessment (*K. Drew*) **Action** 9:50 a.m.
 - Approve Draft Terms of Reference
 - Approve Stock Assessment Subcommittee Membership
7. Presentation of NOAA River Herring Habitat Conservation Plan (*B. German*) 10:05 a.m.
8. Review and Populate Advisory Panel Membership (*T. Berger*) **Action** 10:25 a.m.
9. Other Business/Adjourn 10:30 a.m.

The meeting will be held at The Ocean Place Resort (1 Ocean Boulevard, Long Branch, NJ; 732.571.4000) and via webinar; click [here](#) for details

Atlantic States Marine Fisheries Commission

MEETING OVERVIEW

Shad and River Herring Management Board

November 8, 2022

9:00 a.m. – 10:30 a.m.

Hybrid Meeting

Chair: Justin Davis (CT) Assumed Chairmanship: 2/21	Technical Committee Chair: Brian Neilan (NJ)	Law Enforcement Committee Representative: Warner (PA)
Vice Chair: Lynn Fegley (MD)	Advisory Panel Chair: Pam Lyons Gromen	Previous Board Meeting: May 3, 2022
Voting Members: ME, NH, MA, RI, CT, NY, NJ, PA, DE, MD, DC, PRFC, VA, NC, SC, GA, FL, NMFS, USFWS (19 votes)		

2. Board Consent

- Approval of Agenda
- Approval of Proceedings from May 3, 2022

3. Public Comment – At the beginning of the meeting public comment will be taken on items not on the agenda. Individuals that wish to speak at this time must sign-in at the beginning of the meeting. For agenda items that have already gone out for public hearing and/or have had a public comment period that has closed, the Board Chair may determine that additional public comment will not provide additional information. In this circumstance the Chair will not allow additional public comment on an issue. For agenda items that the public has not had a chance to provide input, the Board Chair may allow limited opportunity for comment. The Board Chair has the discretion to limit the number of speakers and/or the length of each comment.

4. Consider American Shad Habitat Plans/Updates (9:15-9:30 a.m.) Action

Background

- Amendment 3 to the Shad and River Herring FMP requires all states and jurisdictions to submit a habitat plan for American shad. A majority of the habitat plans were approved by the Board in February 2014, and it was anticipated that they would be updated every five years.
- Massachusetts has developed an addition to the state habitat plan to include the Taunton River (**Supplemental Materials**).
- The Technical Committee reviewed the habitat plan and recommends Board approval (**Supplemental Materials**).

Presentations

- Shad Habitat Plan Update by B. Neilan

Board actions for consideration at this meeting

- Consider approval of updated Massachusetts shad habitat plan to include the Taunton River.

5. Consider River Herring Sustainable Fishery Management Plan Updates (9:30-9:50 a.m.) Final Action

Background

- Amendments 2 and 3 to the Shad and River Herring FMP require all states and jurisdictions that have a commercial fishery to submit a sustainable fishing management plan (SFMP) for river herring and American shad, respectively. Plans are updated and reviewed by the Technical Committee every five years.
- Massachusetts submitted an updated SFMP for TC review and Board consideration at the November 2022 meeting, which includes an update on the Nemasket River and a new section for the Herring River (**Supplemental Materials**).
- The Technical Committee reviewed this SFMP updates and recommends Board approval (**Supplemental Materials**).
- In 2020, the Board approved an addendum to the Maine SFMP that allowed for a limited fishery at three locations with a scheduled review in 2022.
- The Technical Committee reviewed the progress on the addendum and recommends....

Presentations

- River Herring Sustainable Fishery Management Plan Updates for Board Consideration by B. Neilan

Board actions for consideration at this meeting

- Consider approval of updated SFMP for Massachusetts

6. Update on 2023 River Herring Benchmark Stock Assessment (9:50-10:05 a.m.) Action**Background**

- The river herring benchmark stock assessment was initiated in April 2022. Nominations to the Stock Assessment Subcommittee were submitted in April and May 2022.
- In July 2022, the Technical Committee met for the Data Workshop and drafted Terms of Reference (**Briefing Materials**).

Presentations

- Update on River Herring Stock Assessment Progress by K. Drew

Board Actions for Consideration

- Approve Draft Terms of Reference and Stock Assessment Subcommittee Nominations

7. Presentation of NOAA River Herring Habitat Conservation Plan (10:05-10:25 a.m.)**Background**

- NOAA's National Marine Fisheries Service, with contributions from ASMFC Staff, produced a management plan to identify critical threats and provide recommendations to improve river herring habitat across the Atlantic states.

Presentations

- Overview of the Habitat Conservation Plan by B. German

8. Review and Populate Advisory Panel Membership (10:25-10:30 p.m.)**Background**

- There are two new nominations to the Shad and River Herring Advisory Panel—Paul Perra, a recreational angler, and Jerry Audet, a recreational angler and outdoor writer (**Briefing Materials**).

Presentations
<ul style="list-style-type: none">• Nomination by T. Berger
Board Actions for Consideration
<ul style="list-style-type: none">• Approve Shad and River Herring Advisory Panel Nominations

9. Other Business/Adjourn

Shad and River Herring 2022 TC Tasks

Activity level: Medium

Committee Overlap Score: Medium (Multi-species committees for this Board)

Committee Task List

- 2023 River Herring Benchmark Stock Assessment
- Updates to state Shad SFMPs
- Annual state compliance reports due July 1

TC Members: Mike Brown (ME), Kevin Sullivan (NH), Brad Chase (MA), Patrick McGee (RI), Jacque Benway Roberts (CT), Wes Eakin (Vice Chair, NY), Brian Neilan (Chair, NJ), Josh Tryniewski (PA), Johnny Moore (DE), Matthew Jargowsky (MD), Ingrid Braun (PRFC), Joseph Swann (DC), Patrick McGrath (VA), Holly White (NC), Jeremy McCargo (NC), Bill Post (SC), Jim Page (GA), Reid Hyle (FL), Ken Sprankle (MA), Ruth Hass-Castro (NOAA), John Ellis (USFWS), Ted Castro-Santos (USGS), C. Michael Bailey (USFWS)

**DRAFT PROCEEDINGS OF THE
ATLANTIC STATES MARINE FISHERIES COMMISSION
SHAD AND RIVER HERRING MANAGEMENT BOARD**

**The Westin Crystal City
Arlington, Virginia**

May 3, 2022

These minutes are draft and subject to approval by Shad and River Herring Management Board.
The Board will review the minutes during its next meeting.

Draft Proceedings of the Shad and River Herring Management Board Meeting
May 2022

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Adjournment 10

These minutes are draft and subject to approval by Shad and River Herring Management Board.
The Board will review the minutes during its next meeting.

INDEX OF MOTIONS

1. **Approval of Agenda** by Consent (Page 1).
2. **Approval of Proceedings of October 19, 2021** by Consent (Page 1).
3. **Move to approve and accept the American Shad Habitat Plans from Connecticut and Massachusetts as presented today** (Page 4). Motion by Malcolm Rhodes; second by Jim Gilmore. Motion approved by consent (Page 4).
4. **Move to approve the Shad Sustainable Fishery Management Plan from the Delaware Basin Coop and the River Herring Sustainable Fishery Management Plan from New York as presented today** (Page 4). Motion by Marty Gary; second by Joe Cimino. Motion approved by consent (Page 4).
5. **Move to approve Fishery Management Plan Review, state compliance reports, and *de minimis* requests for Maine, New Hampshire, Massachusetts, and Florida for American shad and New Hampshire Georgia, and Florida for river herring for the 2020 fishing year** (Page 9). Motion by Pat Keliher; second by Doug Haymans. Motion approved by consent (Page 9).
6. **Move to approve the nomination of Deborah Wilson from ME to the Shad and River Herring Advisory Panel** (Page 10). Motion by Marty Gary; second by Pat Keliher. Motion approved by consent (Page 10).
7. **Move to adjourn** by Consent (Page 10).

ATTENDANCE

Board Members

Pat Keliher, ME (AA)	Roy Miller, DE (GA)
Steve Train, ME (GA)	Craig Pugh, DE, proxy for Rep. Carson (LA)
Cheri Patterson, NH (AA)	Lynn Fegley, MD, Administrative proxy
Dan McKiernan, MA (AA)	Allison Colden, MD, proxy for Del. Stein (LA)
Raymond Kane, MA (GA)	Russell Dize, MD (GA)
Sarah Ferrara, MA, proxy for Rep. Peake (LA)	Pat Geer, VA, Administrative proxy
Justin McNamee, RI (AA)	Shanna Madsen, VA, proxy for Sen. Mason (LA)
David Borden, RI (GA)	Chris Batsavage, NC, proxy for K. Rawls (AA)
Eric Reid, RI, proxy for Rep. Sosnowski (LA)	Jerry Mannen, NC (GA)
Colleen Bouffard, proxy for J. Davis (AA)	Bill Gorham, NC, proxy for Sen. Steinburg (LA)
Bill Hyatt, CT (GA)	Ross Self, SC, proxy for M. Bell (AA)
Jim Gilmore, NY (AA)	Malcolm Rhodes, SC (GA)
Scott Curatolo-Wagemann, NY, proxy for E. Hasbrouck (GA)	Chris McDonough, SC, proxy for Sen. Cromer (LA)
Heather Corbett, NJ, proxy for J. Cimino (AA)	Doug Haymans, GA (AA)
Tom Fote, NJ (GA)	Spud Woodward, GA (GA)
Kris Kuhn, PA, proxy for T. Schaeffer (AA)	Hannah Hart FL, proxy for J. McCawley (AA)
Loren Lustig, PA (GA)	Marty Gary, PRFC
John Clark, DE (AA)	Rick Jacobson, USFWS
	Max Appelman, NOAA

(AA = Administrative Appointee; GA = Governor Appointee; LA = Legislative Appointee)

Ex-Officio Members

Wes Eakin, Technical Committee Vice-Chair

Staff

Bob Beal	Kristen Anstead	Jeff Kipp
Toni Kerns	Katie Drew	Sarah Murray
Maya Drzewicki	Emilie Franke	Caitlin Starks
Tina Berger	Lisa Havel	Deke Tompkins
Pat Campfield	Chris Jacobs	

Guests

Karen Abrams, NOAA	Michael Brown, ME DMR	Alexa Galvan, VMRC
Ronal Amidon, MA F&G	Jeff Brust, NJ DEP	Ben German, NOAA
Pat Augustine, Coram, NY	Margaret Conroy, DE DFW	Angela Giuliano, MD DNR
Alan Bianchi, NC DNR	Nichole Lengyel Costa	Pam Lyons Gromen, WildOceans
Deirdre Boelke, NEFMC	Pam D'Angelo	Greg Hinks, NJ DEP
Jason Boucher, NOAA	Maureen Davidson, NYS DEC	Harry Hornick MD DNR
Bill Brantley, NC DENR	Lennie Day, USGS	David HU, USGS
Delayne Brown, NH F&G	John Duane	Jeff Kaelin, Lund's Fisheries

These minutes are draft and subject to approval by the Shad and River Herring Management Board.
The Board will review the minutes during its next meeting.

Guests (continued)

Carrie Kennedy, MD DNR
Adam Kenyon, VMRC
Rob LaFrance, Quinnipiac Univ
Tom Lilly
Jennifer Malpass, USGS
John Maniscalco, NYS DEC
Genine McClair, MD DNR
Mike Armstrong, MA DMF
Steve Meyers
Mike Millard, US FWS

Clinton Morgeson, VA DWR
Thomas Newman
Derek Orner, NOAA
Willow Patten, NC DENR
Michael Pierdinock
Eric Roach
Scott Schaffer, MA DMF
Ross Self, SC DNR
Alexei Sharov, MD DNR
Ethan Simpson, VMRC

Angela Somma, NOAA
Michael Stangl, DE DFW
Kevin Sullivan, NH FGD
John Sweka, US FWS
Mike Thalhauser, Coastal Fisheries
Alan Weaver, VA DWR
Holly White, NC DENR
Meredith Whitten, NC DENR
Chris Wright, NOAA
Jordan Zimmerman, DE DFW

The Shad and River Herring Management Board of the Atlantic States Marine Fisheries Commission convened in the Jefferson Ballroom of the Westin Crystal City Hotel, Arlington, Virginia, a hybrid meeting, in-person and webinar; Tuesday, May 3, 2022, and was called to order at 10:15 a.m. by Chair Lynn Fegley.

CALL TO ORDER

CHAIR LYNN FEGLEY: Good morning, everybody, this is the Shad and River Herring Management Board. My name is Lynn Fegley; I am an Administrative Proxy from the state of Maryland, and I am the Vice-Chair of this Board. I'm sitting in for Justin Davis, who could not attend today. I ask your forbearance, there are some new faces around the table that I just don't know. If I struggle a little bit to call out names, just bear with me.

APPROVAL OF AGENDA

CHAIR FEGLEY: With that the first order of business is Approval of the Agenda. Are there any changes to the agenda? Okay, we'll call the agenda approved by consent.

APPROVAL OF PROCEEDINGS

CHAIR FEGLEY: Next, you have the proceedings from the October 2021 meeting in your packet. Are there any additions or changes to those proceedings? Okay, we'll call the proceedings approved by consent.

PUBLIC COMMENT

CHAIR FEGLEY: Next, we will move to Public Comment. Do I have any comment from the public? Okay, so with that, and I will just preface this that we'll be looking for a motion at the conclusion of this.

CONSIDER AMERICAN SHAD HABITAT PLANS/UPDATES FROM CONNECTICUT AND MERRIMACK RIVERS

CHAIR FEGLEY: We are going to be looking to consider American Shad Habitat Plans. There

was an update from Connecticut, and a new plan from the Merrimack River. With that I'm going to hand the presentation over to Wes Eakin. Sorry, Wes, if I didn't get that right, to walk us through those two plans. Thank you.

MR. WES EAKIN: No problem. Thanks everyone. My name is Wes Eakin; I'm with the New York State Department of Environmental Conservation. I'm currently the Vice-Chair of the Shad and River Herring TC, and like Lynn, I'm also filling in for our current Chair, Brian Neilan, who was unavailable today.

There are three things that are for your consideration today, as Lynn said the Shad Habitat Plans. We have a couple of state SFMPs, and then a prioritization task. I will for the sake of time give the presentation for the Habitat Plans, and the state SFMPs together, and then pause for questions before moving on to the last item.

A little background on the Shad Habitat Plans. Under Amendment 3 all states and jurisdictions are required to submit habitat plans, which are meant to contain a summary of information on current historical funding habitats, nursery habitats, and threats to those habitats, as well as habitat restoration programs that are occurring within each state. In February 2020, the Board agreed that these plans should be updated every five years, similar to the SFMPs, and ask states to update their existing plans that were originally approved in 2014, and for states with missing plans to submit a new habitat plan. Since then, the Board has approved 15 plans and updates from the states listed below. Last month the TC reviewed, I guess it was in April, a few months ago, or no, it was last month.

Anyway, last month the TC reviewed a plan update for the Connecticut River, and a new plan for the Merrimack. After reviewing the plans, the TC recommended the approval of both of the submitted plans with some minor recommendations for some changes. The first plan for consideration is the Connecticut River Habitat Plan Update. This was submitted by the Connecticut River Atlantic Salmon Commission.

This Plan was an update from the 2021 report, and it's a FERC Comprehensive Plan. It takes habitat-based production units by river segment, and a minimum adult annual population target. It also defines past performance metrics, and both of the above mentioned, like I said, have been accepted by FERC as a comprehensive plan.

The identified threats were fish passage, hydropower, and invasive hydrilla expansion. The TC recommended minor formatting changes be noted for future versions to consider requiring states to report more specific water quality parameters that cause degradation. I think it's also important to note here that having a FERC comprehensive plan has a little bit of teeth to it.

The TC recognizes that and it's recommending that states, if possible, have their habitat plans approved by FERC as a comprehensive plan. The next Habitat Plan is from the Merrimack River. That was submitted by the Merrimack River Anadromous Program. For the habitat assessment, American shad can only have access to 38 percent of the historical main stem habitat, and major tributaries from the mouth up to the Garvin's Falls Hydroelectric Facility.

In the accessible reaches, passage inefficiencies due to poor facility design or seasonal flow regimes limit restoration goals and improvements must be made to the FERC process and engagement with dam owners. They listed a few threats here, the Plan identifies those threats as barriers to upstream/downstream migration, hydropower, anthropogenic habitat changes and climate change.

Within the Merrimack System there have been significant and ongoing habitat restoration efforts to understand and reduce the impacts of threats to American shad and shad spawning in nursery habitats identified in the Plan. The recent restoration efforts include targeting of several dams for removal or passage installation.

Since 2009 the MRTC has maintained an active hatchery supplementation program, as well as truck and transfer of gravid fish upriver. They have coordinated water quality monitoring on the main stem and tributaries, and the respective state agencies, federal agencies, nonprofits, and power companies and others.

The TC recommended including language to define the passage standards that Massachusetts is using, which is an upstream passage efficiency of 80 percent.

CONSIDER SHAD AND RIVER HERRING SUSTAINABLE FISHERY MANAGEMENT PLAN UPDATES

MR. EAKIN: Moving into the Shad and River Herring SFMP Plan Updates. Amendment 2 and 3 of the FMP requires states looking to have a fishery to submit a sustainable fisheries management plan that will demonstrate that their stock is supporting commercial and/or recreational fishery that will not diminish the future of stock reproduction and recruitment. These plans are updated and reviewed every five years, to reassess stock status and sustainability.

DELAWARE RIVER BASIN (AMERICAN SHAD)

MR. EAKIN: Last month the TC reviewed plans for shad in the Delaware River Basin, and river herring in the Hudson River. After reviewing the Plans, the TC recommends approval of both the plans that submitted. We'll start with the Delaware Basin American shad FMP Update. Those were submitted by the Delaware River Basin and Wildlife Management Cooperative.

The updated plan proposes a new female mortality benchmark, with more conservative thresholds and triggers relative to triggers to the current metrics already in use. Proposed changes to management include the implementation of commercial harvest quota for the state of New Jersey, and Delaware representing at 33 percent reduction from the most recent 10-year average, excluding the anomalous 2014 harvest.

These minutes are draft and subject to approval by the Shad and River Herring Management Board.
The Board will review the minutes during its next meeting.

Another management option is reduction in commercial creel limit from 3 fish down to 2 fish. These new metrics were developed in response to the most recent benchmark stock assessment, which indicated that there was unsustainable female adult mortality for the Delaware stock. For future potential management actions.

If one or more of the benchmarks are exceeded, the Co-op will implement management actions commensurate with the benchmark exceedance. Some options for the commercial fishery would be gear, area, seasonal restrictions, escapement periods, trip limits, quota with an in-season closure in Delaware, reduced quota in Delaware and New Jersey.

Also, an option is the closure of the commercial fishery. The other measures could be determined later. On the rec side of things, creel limit reductions to 1-fish per day, go to recreational catch and release only, seasonal area and gear, closures and restrictions. There is always the option of closure of the recreational fishery and other measures to be determined.

HUDSON RIVER (RIVER HERRING)

MR. EAKIN: For the Hudson River, River Herring SFMP Update. Stock status mortality estimates have either remained stable or decreasing, and they are below a new sustainability target. Mean length and mean length at age has been either increasing or stable. Frequency of repeat spawning has been increasing, and our YOY index has been erratic, but we are not experiencing recruitment failure.

The new sustainability threshold that's being proposed is based on the adult female total mortality using a Z40 threshold, similar to what was done in the recent shad stock assessment, and those resulting thresholds for female alewife is a Z of 1.26 and 1.19 for blueback. This is in addition to the already in use YOY index, commercial CPUE, repeat spawning,

mean length/mean length at age, benchmark or metrics in the biggest plan.

The Hudson River is requesting status quo, based on the regulations that were in place in 2013 to the continuation of a restricted fishery in the Hudson. No nets in tributaries, gear, mesh and area restrictions, 36-hour escapement period for all commercial gears, continuation of our recreational possession limit of 10-fish per person, and a moratorium in all other state waters. Proposed management actions, New York will take immediate management action following recruitment failure or unsustainable adult female mortality, and potential management actions may include, but not limited to gear restrictions, area restrictions and permit system restructuring. With that I'll pause if anyone has any questions on their habitat plans or the SFMPs.

CHAIR FEGLEY: Great, thank you, Wes, and really nice job getting through in a very concise way. Does anybody have any questions for Wes, either about the Habitat Plan for Shad, or the Sustainable Fishery Management Plan? Any questions? Bill Hyatt.

MR. WILLIAM HYATT: Just a quick question, and I might have missed something. The Delaware Plan was made necessary, because it is identified as basically the stock was identified as unsustainable in the 2020 stock assessment benchmark, and there were a couple of other stocks that were similarly identified in that benchmark, I think the Connecticut River and the Potomac.

My question has to do with, what is the timeframe required for responding to that unsustainable determination? I guess it's from the 2020 stock assessment. Delaware is doing so now, I think there are a couple that still have to be addressed, and I'm just wondering what the timeframe requirement might be if there is one.

MR. EAKIN: Yes, I can take a shot at that. Caitlin or James, feel free to jump in. But my understanding is there was no requirement to respond to the

results of the stock assessment. But, Caitlin, if you want to correct me if I'm wrong.

MS. CAITLIN STARKS: That's correct, there is no requirement.

MR. HYATT: Okay, thank you.

CHAIR FEGLEY: I think what I would like to do here. Are there any other questions about these two items? Okay, so we're going to need a motion, and I think what I would like to do is do two separate motions, one for habitat and one for sustainable management plans. Dr. Rhodes, I'll start with you.

DR. MALCOLM RHODES: All right, well I would move to approve and accept the American Shad Habitat Plans for the Connecticut and Merrimack Rivers.

CHAIR FEGLEY: Terrific, thank you, Malcolm Rhodes, and Jim Gilmore is that a second? Excellent, okay. Is there any discussion on this motion? Okay, I'm just going to read it into the record and call the question. The motion is to move to approve and accept the American Shad Habitat Plans from Connecticut and Massachusetts as presented today. Motion by Dr. Rhodes, second by Mr. Gilmore. Is there any opposition to this motion? **Okay, we'll consider it approved by consent.** Thank you very much, and then I'll be looking for a motion for the Sustainability Plans, Martin Gary.

MR. MARTIN GARY: I would move to consider the American Shad and River Herring Sustainable Fishery Management Plans for New York for river herring and for the Delaware River Basin Cooperative for American shad.

CHAIR FEGLEY: Excellent, is there a second? Joe Cimino, I think. All right, is there any discussion on this motion? All right, I'll read it into the record. The motion is move to approve the Shad Sustainable Fishery Management Plan for the Delaware Basin Co-op and the River

Herring Sustainable Fishery Management Plan from New York as presented today.

Motion by Mr. Gary, second by Mr. Cimino. Is there any opposition to this motion? Excellent. **Okay, we'll consider that approved by consent.**

CONSIDER TECHNICAL COMMITTEE REPORT ON BOARD TASK ON PRIORITIZING SYSTEMS FOR SHAD RECOVERY AND DEVELOPING INVENTORY OF AVAILABLE DATA TO SUPPORT DEVELOPMENT OF FISH PASSAGE CRITERIA

CHAIR FEGLEY: The next item on the agenda is to look at the tasks that the **Board presented to the TC**, which was to prioritize systems for shad recovery, and develop that inventory of data. I think we're going back to Wes for that.

MR. EAKIN: A little background on this task. Following a 2020 stock assessment, in which they examined fish passage performance and its effects on shad production potential, they used standardized data and simulation modeling, and determined that the overall dams completely or partially blocked nearly 40 percent of the historical American shad habitat.

In May, 2021, at the TCs recommendation the Board tasked the TC with prioritizing systems for shad recovery, and developing an inventory of available data that would support the development of fish passage criteria. In response to that task the TC formed a task group to develop information and draft recommendations for TC review.

The steps taken in development of the task, a query of FERC projects currently or soon to be relicensed in the next decade. U.S. Fish and Wildlife and NOAA have Section 18 Fish Passage Prescription Authority, which is a legal tool to have FERC direct hydro project donors to implement and evaluate passage and protection measures.

As a result of that a total of 158 FERC projects were identified from Maine to Florida, based only on the FERC license status and schedule. The TC members from each state were then asked to decide whether

a project in their state was a priority, based on the following criteria. Whether they have an existing recovery plan, have performance standards, upstream passage, downstream passage and is Alosine passage needed, and is the system a state priority?

Ultimately the TC developed a list of 34 priority FERC license projects based on the above criteria. I apologize, I don't think the table is coming up were included in the briefing material. For each priority project the TC recommends that the relevant state and federal agencies determine the extent to which their existing restoration or management plans are current and relevant for information to best address upstream and downstream passage, specific to their goals and/or objectives.

This includes considering the following, which if an existing plan information doesn't suitably address fish passage, the plan should be updated with state and federal participation with staff familiar with both Section 18 Authorities, and water quality certifications. Specific passage performance criteria should be discussed and developed by agencies. Criteria should rely on a first set of information for supporting the rationale, including but not limited to the plan goals and objectives. Performance targets should address rates of passage success that include percent passage success for fish arriving at a project area, a time component to address delay as part of passage success, and survival rates with project passage.

Then as Lynn mentioned earlier, plans should be submitted to FERC for status as comprehensive management plans requiring FERC licensees to address these plans. This is a table of the summarized FERC projects by state, with the questionnaire responses. As you can see, we ended up with a total of 34. This takes that same 34 priority projects and identifies the river systems that they're located in, and how many projects per river system. I'll be glad to take any questions on this as well.

CHAIR FEGLEY: Great, thank you, Wes. Are there any questions on this for Wes? Wes, I had one for you. I was very interested when I read the Merrimack Plan, or maybe it's for Massachusetts or New Hampshire that there are 7 dams in the Merrimack that would, if there were projects implemented, would double access to spawning area. I wonder, are those 7 dams included on this prioritization?

MR. EAKIN: That is a good question. I am not sure. I was not part of this task group, but Caitlin was more involved than myself. She might be better able to answer that.

CHAIR FEGLEY: It was a curiosity question.

MR. EAKIN: I have listed three as priority projects. I would assume that they would be.

CHAIR FEGLEY: Okay, well in the interest of time we'll move on. I think the next step is Caitlin, we need to have possible action to approve the prioritization. Is that what we're doing?

MS. STARKS: The Board can take an action if it wishes, but I don't believe any action is needed. Essentially the presentation of this is the final product of the task that the Board asked for. The table that you see here is not the only product, there is an extensive Excel Spreadsheet that we will send out to the Board.

That contains all of the information on each of those river systems, what the TC identified as needed in those systems, and what data are available for the development of passage standards. The idea is for the states to be able to take that information and use it when they are looking at their own passage improvements, I guess, across the coast.

CHAIR FEGLEY: Excellent, thank you, Caitlin. In the interest of time, we'll move on. We'll assume since there are no questions and there doesn't appear to be any objections, we will accept. Oh, Bill Hyatt, sorry, apologies. Go ahead.

MR. HYATT: I almost forgot I had my hand up. Yes, I just had a real quick question and it's just curiosity as to why the prioritization effort was limited to FERC projects alone. Part of the reason I'm asking is, I know that there is a high priority project on a large dam facility that isn't FERC regulated as part of the Connecticut River Basin. Just a general question as to why this prioritization effort was limited exclusively to FERC projects.

MR. EAKIN: I'm not sure. I'm going to assume that this was a low hanging fruit that we are able to access the FERC database. But Caitlin, if you have any other insight.

MS. STARKS: Beyond that it is lower hanging fruit. The TC thought it was appropriate to focus on these FERC projects, because they are coming up for relicensing in the next 10 years or so, and those relicensing periods provide a really good opportunity to add some requirements to those projects to improve fish passage for shad and river herring. That is why the TC focused on FERC projects in this case.

MR. HYATT: If I could follow up, Lynn. I'll just add, I totally understand that. Just point out that sometimes prioritization lists are used in process of awarding grant monies and making decisions, and just that recognizing that compiling a FERC list is easiest, and obviously covers almost all of the priorities that there might be some priority projects that might want to be considered that don't fall under the FERC umbrella.

CHAIR FEGLEY: Thank you, Bill, I think that is well noted for the record. Unless there is any objection, oh and Roy Miller has a question, followed by Chris Wright.

MR. ROY W. MILLER: Just a quick follow up to Bill Hyatt's question. I noticed the absence of any New Jersey/Delaware listing there. Can I assume, is this the total list of FERC projects, or is it an incomplete list? Specifically, I guess the dams on the Lehigh and the Schuylkill on the

Delaware Basin are not are not FERC projects, hence they are missing from this list. Is that correct that this is the totality of FERC projects?

MS. CAITLIN: No, this is a list of FERC projects that the TC identified as priorities through the process that Wes described in his presentation. There was an original list that was much larger.

CHAIR FEGLEY: Chris Wright, you're up.

MR. CHRIS WRIGHT: I just wanted, we at NOAA Fisheries wanted to thank the TC for the report. This will be a valuable resource for FERC relicensing negotiations and other inputs. But we just wanted to thank the TC for the report and their work on this effort. It's going to help us a lot in the future. Thank you.

CHAIR FEGLEY: Okay, are there any other questions? I think right now what we're going to do is we're going to move forward with this prioritization list, oh and we've got Alan Weaver, you're up.

MR. ALAN WEAVER: Yes, I just joined about ten minutes ago. For Virginia, I'm the fish passage coordinator for Virginia, I see Appomattox. We also have Emporia Dam on the Meherrin River in Virginia. You know it has shad and herring actually, we know shad and herring get to that site. That site has a lot of issues. The fishway on the Appomattox at Brassfield Dam is certainly operational. It hasn't really been put to the test that much yet, because we just opened up downriver some dams, and we don't know if target fish are getting there yet. But we know target fish are getting to the Emporia Dam, and I'm just wondering how the Emporia Dam project did not make this list, I guess is my question.

MS. STARKS: Wes, I can try to take this one, since you weren't involved in this task group. But if you did not see the beginning of the presentation that might have explained it. I have a large list of projects. This will be sent out to the states. You can review that list when we send it out, and let us know. I don't know if Emporia Dam is FERC, and

whether it's coming up for relicensing, but that affected the list of 34 that the TC prioritized.

MR. WEAVER: Yes, I mean it's a priority for NOAA, Fish and Wildlife Service, us, you know DWR. I mean it's a priority for fish passage. I don't know how this list affects what FERC is going to do about that site, but anyway. If there is another list. If there is more information that will be coming, I'll wait to look at that. I just wanted to mention the Emporia site.

CHAIR FEGLEY: I think what we're going to do is this list is going to be distributed. We have a stock assessment underway. I think what we're recognizing is that there are non-FERC dams that are not on this list. We have that noted for the record. I think this group is going to be very busy with this upcoming stock assessment.

CHAIR FEGLEY: But what we may want to do is go back around, and once that stock assessment is completed and we see the results of that. We may want to think again about maybe taking a deeper look at some of these non-FERC dams. If that is acceptable to the Board, I think we'll go ahead and move forward. Does anybody have any more comments on this? Okay, good.

**CONSIDER SHAD AND RIVER HERRING FMP
REVIEW AND STATE COMPLIANCE FOR THE
2020 FISHING YEAR**

CHAIR FEGLEY: With that the next item on the agenda is Fishery Management Plan Review and Compliance. I think for that we're going over to James Boyle.

MR. JAMES BOYLE IV: Good morning, everybody. As mentioned, yes, I am going to be going through the Shad and River Herring FMP Review AND State Compliance for the fishing year of 2020. As a quick overview of the presentation, I'm going to start with a short reminder of historical landings over time, and then get into the 2020 fishing year specifically.

Then, next I will move on to some of the monitoring and the compliance reports, including fish passage, stocking efforts and sturgeon bycatch interactions. Finally, I'll end with the de minimis requests and the report and recommendations from the Plan Review Team. Just a quick reminder of the historical context. This figure shows the trajectories of commercial landings for river herring and American shad since 1950.

Starting in the 1970s river herring landings fell drastically and then steadily decreased over time. For shad there has also been a steady decrease in landings over time, which is of course in part due to the moratoria implemented through Amendments 2 and 3. It's difficult to see what is going on at the end of that time series in the first figure.

This is a zoom in of landings since 1990, where there is a little more variation for river herring with landings increasing from 2016 to 2019 until decreasing a little bit in 2020. For shad you see a general downward trend in landings since the 1990s. Moving on to 2020. This table shows state landings and coastwide totals for our commercial shad and river herring, excluding confidential data. For river herring coastwide commercial landings, including bycatch, the total is just over 2 million pounds, which is a 36 percent decrease from the 2019 landings. Some of you may notice that the numbers here are slightly different than in the draft FMP report.

Since drafting the document I did some digging into the dramatically reduced bycatch landings for river herring, and found additional landings to include in this column, so this number of 167,445 pounds is the latest updated number. That is still a significant reduction in bycatch at 77 percent from 2019, which is almost entirely attributable to lower bycatch reported in Massachusetts.

Although it is important to note that as of the 2020 fishing year, Massachusetts eliminated their state portside sampling program, only reporting NOAA Northeast Fishery Observer Program or NEFOP data. For American shad the total 2020 commercial landings, directed and bycatch, reported in

compliance reports was 407,479 pounds, which is a 49 percent increase from landings in 2019.

However, bycatch landings of shad are down 24 percent. Reported hickory shad commercial landings was 92,023 pounds, which is a 36 percent decrease from 2019. I will note that the directed and bycatch totals are both confidential, as individually they don't satisfy the rule of three, but the sum of both is the correct number, so the 92,000 is accurate.

As part of the requirements in Amendments 2 and 3 for river herring and shad, passage counts are required on select rivers in Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, Pennsylvania, Maryland and South Carolina, 6.25 million counted river herring represents a 4.4 percent decrease compared to 2019, and 713,520 shad is a 63 percent increase compared to 2019.

Although it is important to note, as will come up again later, that many states could not complete all of their monitoring requirements due to the COVID 19 pandemic. For passage monitoring for river herring in the Androscoggin River in Maine and the Schuylkill River in Pennsylvania was not able to be completed, as well as three locations on the Susquehanna River in Pennsylvania, Maryland and Delaware, could also not complete their monitoring for both shad and river herring.

During 2020 hatchery reared American shad fry were stocked in the Pawtucket River in Rhode Island and the Santee River in South Carolina, totaling 14.7 million American shad. That is a 22 percent increase from 2019. Maine also continues to participate in trap and transfer stocking of adult pre-spawning alewife of wild origin on the Androscoggin River. As we said before, we're only talking about nursery hatched fry so not wild caught fish.

For sturgeon interactions in 2020 there were 73 reported interactions with 0 fatalities. Although there is a note to that that New Jersey gillnetters report the weight of discarded

sturgeon not individuals. They reported 2,921 pounds. Of those 73 interactions, 39 were identified as Atlantic sturgeon, 5 as short nose, and 29 were unclassified. Rhode Island, as a quick note, reports NOAA, NEFOP and At-Sea Monitoring Data, which is available after the compliance report submission deadline. Therefore, their data lags by one year, so for the 2020 fishing year Rhode Island reported 9 interactions from 2019, and then we will see the 2020 interactions in this year's compliance report in July. The upcoming fishing year Maine, New Hampshire, Massachusetts and Florida have requested de minimis status for their shad fisheries, and New Hampshire, Georgia and Florida request de minimis status for river herring.

They have all met the requirements and qualify for de minimis status based on their commercial landings being less than 1 percent of the coastwide landings. In evaluating the state compliance reports the PRT did note some inconsistencies with requirements in Amendment 2 and 3. The only issue that seems worthy of note is the monitoring that was not completed due to the pandemic.

A full description of the missing monitoring can be found in Table 6 of the FMP report, so we have like an inventory of everything that was missed. Some other small inconsistencies with the new compliance report template that this is only the second, I think time it's been used, but it's working very well.

This is not including some sections, even just to say not applicable, but we'll work with the state to correct these in future reports that again didn't rise to the level of concern for the PRT. With those minor issues, and given the circumstances regarding the monitoring. The PRT did not feel that it should be held against the states, and recommended approval for the compliance reports for 2020.

The PRT did have one recommendation, which is to move Section 8B, which provides the result of hickory shad monitoring to the appendices. This change would allow states to conduct hickory shad monitoring a place to share the results, while removing optional data from the main body of the

compliance report, thereby further streamlining the compliance review process of this new format.

With that information the action for the Board is to consider approval of the 2020 shad and river herring FMP review, the state compliance reports and de minimis status for Maine, New Hampshire, Massachusetts, Georgia and Florida. Are there any questions? Thank you.

CHAIR FEGLEY: Excellent, thank you so much, James. Okay, any questions from the Board? Allison Colden, you're up.

DR. ALLISON COLDEN: Thank you, James for that presentation. I noted when you mentioned earlier that the river herring bycatch numbers have been adjusted, but also that the portside monitoring program in Massachusetts had ended, and they were only reporting the fishery observer data. Do you have any indication or context on how the observer program may have been impacted by COVID, in terms of numbers of days lost in the Observer Program or any other information?

MR. BOYLE: I don't have any of that context. But I can look into that. I'm not sure if anybody else has any knowledge of that from NOAA.

CHAIR FEGLEY: It doesn't look, Allison, like anybody around the table can offer additional information on that. It's noted on the record, and if some information can be turned up, we can certainly forward that to you. Are there any other questions on FMP review and state compliance? Okay, so I'll be looking for a motion to approve these, and I have Pat Keliher.

MR. PATRICK C. KELIHER: I would move to approve the Fishery Management Plan Review, state compliance reports and de minimis requests for Maine, New Hampshire, Mass and Florida for American shad, and New Hampshire, Georgia and Florida for river herring for the 2020 fishing year.

CHAIR FEGLEY: I have Doug Haymans, I believe for a second. Okay, I will read it into the record. Move to approve Fishery Management Plan Review, state compliance reports and de minimis requests for Maine, New Hampshire, Massachusetts, and Florida for American shad, and New Hampshire, Georgia and Florida for river herring for the 2020 fishing year.

Motion by Mr. Keliher, second by Mr. Haymans. Is there any discussion on the motion? **Okay, is there any opposition to the motion?** That's brilliant

UPDATE ON THE 2023 RIVER HERRING BENCHMARK STOCK ASSESSMENT

CHAIR FEGLEY: We are moving on to our next agenda item which is going to be Dr. Katie Drew is going to lead us through an update on the 2023 River Herring Benchmark Stock Assessment.

DR. KATIE DREW: Basically, we have a benchmark scheduled. The terminal end result of the assessment will be presented to the Board at the annual meeting in 2023, so about a year and a half from now. This is the current timeline. You can see the data submission deadline is going to be July 1st, 2022, followed by a data workshop which will be virtual, July 12 through 14. We have then a methods workshop, and an assessment workshop to be followed after that to have a peer review in August of 2023. This is the current broad timeline.

DISCUSS STOCK ASSESSMENT SUBCOMMITTEE MEMBERSHIP

DR. DREW: This will be an ASMFC external peer review, so there is a little bit of flexibility in this timeline if things become difficult, but this is kind of what we're shooting for right now. The main component that we're sort of updating you about, and we would like some feedback on is basically we are requesting nominations for the Stock Assessment Subcommittee at this point.

The deadline for that is May 20th, and we are, as a reminder, looking for expertise in river herring biology and stock assessment, especially data poor

methods for this species complex. I believe the call for nominations was sent to the Administrative Commissioners earlier, or at the end of last month, and the deadline will be coming up soon for that. I'm happy to take any questions on the stock assessment process.

CHAIR FEGLEY: Thank you very much, Katie. Are there any questions on the stock assessment? Jason McNamee.

DR. JASON McNAMEE: Hey Katie, wondering what you guys are thinking about, you know the potential for those missing data elements, if you guys are thinking ahead of that a little bit, what you might do there.

DR. DREW: I think this is going to be one of our, throw everything at the wall and see what sticks assessments. Obviously, this is a data limited stock, and we have limited data that is different from river to river, so we have to be kind of creative in terms of what we're doing. I think we'll follow the shad assessment in a lot of the things that they sort of moved the ball forward with for these species. But I think it's going to be hard to figure out the exact details until we see all of the data in front of us, and figure out what we have and what we don't have.

CHAIR FEGLEY: Any other questions about the upcoming benchmark? Okay, that's great.

REVIEW AND POPULATE ADVISORY PANEL MEMBERSHIP

CHAIR FEGLEY: We have one final item of business, and that is to review and populate the Advisory Panel membership, and we are going to send it over to Tina Berger for that.

MS. TINA L. BERGER: I offer for your consideration and approval a new nomination from Maine, Deborah Wilson, who has been involved in Maine fisheries and fisheries management for over 40 years. Her nomination form and information were provided in the main meeting materials. Thank you.

CHAIR FEGLEY: I'm looking at a hand raised from Marty Gary.

MR. GARY: Madam Chair, I just move to approve that nomination.

CHAIR FEGLEY: Okay, and I have a second from Pat Keliher. Is there any discussion on this motion? I think she's going to be a great asset to this group. I will read the motion into the record then. The motion is to approve the nomination of Deborah Wilson from Maine to the Shad and River Herring Advisory Panel. We had a motion by Martin Gary, second by Pat Keliher. Okay, is there any opposition? **Great, we are approved by consent.**

ADJOURNMENT

CHAIR FEGLEY: At the very last order I'll ask, is there any opposition to adjourning this meeting? Okay, we stand adjourned, well done.

(Whereupon the meeting adjourned at 11:00 a.m.
on Tuesday, May 3, 2022)

Terms of Reference for ASMFC River Herring Benchmark Stock Assessment

Draft for Board Approval – July 14, 2022

1. Define and justify stock structure.
2. Characterize precision and accuracy of fishery-dependent and fishery-independent data used in the assessment, including life history data (e.g., age and repeat spawner data) and nontraditional data (e.g., entrainment, impingement, passage). Characterization should include the following but is not limited to:
 - a. Provide descriptions of each data source (e.g., time series, geographic location, sampling methodology and changes, potential explanation for outlying or anomalous data).
 - b. Describe calculation and potential standardization of abundance indices.
 - c. Discuss trends and associated estimates of uncertainty (e.g., standard errors).
 - d. Where possible, explore reader consistency, potential bias, and agreement statistics for age and repeat spawner data.
 - e. Justify inclusion or elimination of available data sources.
3. Estimate bycatch where and when possible.
4. Summarize data availability and trends by stock.
5. If possible, develop models used to estimate population parameters (e.g., Z , biomass, abundance) and biological reference points, and analyze model performance.
 - a. Briefly describe history of model usage, its theory and framework, and document associated peer-reviewed literature. If using a new model, test using simulated data.
 - b. Clearly and thoroughly explain model strengths and limitations.
 - c. Discuss the effects of data strengths and weaknesses (e.g., temporal and spatial scale, gear selectivity, ageing accuracy, sample size) on model inputs and outputs.
 - d. State assumptions made for all models and explain the likely effects of assumption violations on synthesis of input data and model outputs. Examples of assumptions may include (but are not limited to):
 - Choice of stock-recruitment function.
 - Calculation of M . Choice to use (or estimate) constant or time-varying M and catchability.
 - Choice of equilibrium reference points or proxies for MSY-based reference points.
 - Choice of a plus group for age-structured species.
 - Constant ecosystem (abiotic and trophic) conditions.
 - e. Justify choice of coefficients of variation (CVs), effective sample sizes, or likelihood weighting schemes.
 - f. Describe stability of model (e.g., ability to find a stable solution, invert Hessian).

- g. Perform sensitivity analyses for starting parameter values, priors, etc. and conduct other model diagnostics as necessary.
 - h. Characterize uncertainty of model estimates and biological or empirical reference points.
 - i. If multiple models were considered, justify the choice of preferred model and the explanation of any differences in results among models.
- 6. If possible, develop methods to calculate a biologically-based cap or limit on bycatch of river herring in ocean fisheries.
- 7. Recommend stock status as related to reference points, if available.
- 8. Other potential scientific issues:
 - a. Compare trends in population parameters and reference points with current and proposed modeling approaches. If outcomes differ, discuss potential causes of observed discrepancies.
 - b. Compare reference points derived in this assessment with what is known about the general life history of the exploited stock. Explain any inconsistencies.
 - c. Explore climate change impacts on the species.
 - d. Explore predation impacts on the species.
 - e. Discuss all known anthropogenic sources of mortality and productivity (i.e., stocking, passage mortality) by stock.
- 9. If a minority report has been filed, explain majority reasoning against adopting approach suggested in that report. The minority report should explain reasoning against adopting approach suggested by the majority.
- 10. Develop detailed short and long-term prioritized lists of recommendations for future research, data collection, and assessment methodology. Highlight improvements to be made by initiation of next benchmark stock assessment. Note research recommendations from the previous assessment that have not been addressed and those that have been partially or fully addressed.
- 11. Recommend timing of next benchmark assessment and intermediate updates, if necessary relative to biology and current management of the species.

Terms of Reference for Peer Review of ASMFC River Herring Stock Assessment

1. Evaluate choice of stock structure.
2. Evaluate the thoroughness of data collection and the presentation and treatment of fishery-dependent and fishery-independent data in the assessment, including the following but not limited to:
 - a. Presentation of data source variance (e.g., standard errors).
 - b. Justification for inclusion or elimination of available data sources.
 - c. Consideration of data strengths and weaknesses (e.g., temporal and spatial scale, gear selectivities, ageing accuracy, sample size).
 - d. Calculation and/or standardization of abundance indices.
 - e. Estimation of bycatch.
3. Evaluate the methods and models used to estimate population parameters (e.g., Z , biomass, abundance), biological reference points, and bycatch caps/limits including but not limited to:
 - a. Evaluate the choice and justification of the preferred model(s). Was the most appropriate model (or model averaging approach) chosen given available data and life history of the species?
 - b. If multiple models were considered, evaluate the analysts' explanation of any differences in results.
 - c. Evaluate model parameterization and specification (e.g., choice of CVs, effective sample sizes, likelihood weighting schemes, calculation/specification of M , stock-recruitment relationship, choice of time-varying parameters, plus group treatment).
 - d. Evaluate the diagnostic analyses performed, including but not limited to:
 - Sensitivity analyses to determine model stability and potential consequences of major model assumptions.
 - e. Evaluate the methods used to characterize uncertainty in estimated parameters. Ensure that the implications of uncertainty in technical conclusions are clearly stated.
4. If a minority report has been filed, review minority opinion and any associated analyses. If possible, make recommendation on current or future use of alternative assessment approach presented in minority report.
5. Recommend best estimates of stock biomass, abundance, and exploitation from the assessment by stock for use in management, if possible, or specify alternative estimation methods.
6. Evaluate the choice of reference points and the methods used to determine or estimate them. Recommend stock status determination from the assessment, or, if appropriate, specify alternative methods/measures for management advice.

7. Review the research, data collection, and assessment methodology recommendations provided by the TC and make any additional recommendations warranted. Clearly prioritize the activities needed to inform and maintain the current assessment, and provide recommendations to improve the reliability of future assessments.
8. Recommend timing of the next benchmark assessment and updates, if necessary, relative to the life history and current management of the species.
9. Prepare a peer review panel terms of reference and advisory report summarizing the panel's evaluation of the stock assessment and addressing each peer review term of reference. Develop a list of tasks to be completed following the workshop. Complete and submit the report within 4 weeks of workshop conclusion.



Atlantic States Marine Fisheries Commission

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MEMORANDUM

October 12, 2022

To: Shad and River Herring Management Board

From: Tina Berger, Director of Communications

RE: Advisory Panel Nominations

Please find attached two nominations to the Shad and River Herring Advisory Panel – Paul Perra, a recreational angler, and Jerry Audet, a recreational angler and outdoor writer. Both nominees are from Massachusetts. Please review these nominations for action at the next Board meeting.

If you have any questions, please feel free to contact me at (703) 842-0749 or tberger@asmfc.org.

Enc.

cc: James Boyle

M22-102

SHAD & RIVER HERRING ADVISORY PANEL

Bolded names await approval by the Shad & River Herring Management Board

October 12, 2022

Maine

River Herring:

Deborah Wilson (conservation)
374 Bayview Road
Nobleboro, ME 04555
Phone: (207)380-6997
Deb.wilson1028@gmail.com
Appt Confirmed 5/3/22

Mike Thalhauser (comm)
Alewife Harvesters of Maine
13 Atlantic Avenue
Stonington, ME 04681
207.367.2708
mthalhauser@coastalfisheries.org
Appt. Confirmed 10/30/19

Shad:

Vacancy - shad rec

New Hampshire

Shad & River Herring:

Eric Roach (rec)
54A Foggs Lane
Seabrook, NH 03874
Phone: 603.502.0928
Eroach1970@gmail.com
Appt Confirmed 2/4/21

Massachusetts

Shad & River Herring:

Paul Perra (rec)
5 Candleberry Court
Bourne, MA 02532
Phone: 978.381.4746
pperra@icloud.com

Jerry Audet (rec/outdoor writer)
286 Yew Street
Douglas, MA 01516
Phone: 304.906.1298
indeepoutdoorswmedia@gmail.com

River Herring:

Vacancy

Connecticut

Shad & River Herring:

2 Vacancies

New York

Shad & River Herring:

Byron Young
53 Highview Lane
Ridge, NY 11961
Phone: (631) 821-9623
Cell: (631) 294-9612
Fax: (631) 821-9623
Email: youngb53@optimum.net
Appt. Confirmed 5/5/08
Chair from 1/09- 1/11
Confirmed interest in March 2019

New Jersey

Shad:

Vacancy – recreational

Shad & River Herring:

Jeff Kaelin (comm. trawl and purse seine)
Director of Sustainability and Government
Relations
Lund's Fisheries, Inc.
997 Ocean Drive
Cape May, NJ 08204
Phone: 207.266.0440
jkaelin@lundsfish.com
Appt Confirmed 8/20/09
Confirmed interest in March 2019

Pennsylvania

Vacancy

Delaware

Shad & River Herring:

Dr. Edward Hale
Delaware Sea Grant
23 Gosling Drive
Lewes, DE 19958
Phone: 302.470.3380
EHale@udel.edu
Appt Confirmed 2/4/21

Maryland

Shad & River Herring:
Vacancy - recreational

Virginia

Shad & River Herring:
Vacancy

Shad:
Vacancy

North Carolina

River Herring:
Louis Ray Brown, Jr. (rec)
212 Walnut Creek Drive
Goldsboro, NC 27534
Phone (day): (919) 778-9404
Phone (eve): (919) 778-9792
FAX: (919) 778-1197
Email: lrbrown@nc.rr.com
Appt. Confirmed 5/5/08; 8/18
Confirmed interest in March 2019

Vacancy – commercial

South Carolina

Shad:
Thomas M. Rowe, Jr. (rec)
4625 Flounder Lake Drive
Meggett, SC 29449
Phone: 843-908-0247
FAX: 843-549-7575
Email: thomasmrowe@hotmail.com
Appt Confirmed 8/3/10
Confirmed interest in Sept 2017

Vacancy – commercial net

Georgia

River Herring:
Fulton Love (dealer)
6817 Basin Road
Savannah, GA 31419
Phone: (912)925-3616
FAX: (912)925-1900
Appt. Confirmed 10/30/95
Appt. Reconfirmed 9/8/99; 3/19/08

No response to Sept 2017 or March 2019 inquiry regarding continuing interest in serving on AP

Florida

Shad & River Herring:
2 vacancies

Potomac River Fisheries Commission

River Herring:
Kevin L. Gladhill (rec)
21370 Mount Lena Road
Boonsboro, MD 21713
Phone (day): (301)988-6697
Phone (eve): (301)714-1074
Email: KLGladhill@myactv.net
Appt. Confirmed 5/5/08
No response to Sept 2017 or March 2019 inquiry regarding continuing interest in serving on AP

Vacancy – commercial pound net

District of Columbia

Shad:
Joe Fletcher (rec)
1445 Pathfinder Lane
McLean, VA 22101
Phone (day): (202)244-0461
Appt. Confirmed 10/30/95
Appt. Reconfirmed 9/15/99
Appt. Reconfirmed 4/21/08
No response to Sept 2017 inquiry regarding continuing interest in serving on AP

Nontraditional Stakeholders

Chair, Pam Lyons Gromen (fisheries conservation) (1/11)
Executive Director
Wild Oceans
1793 Sandy Court
Springboro, Ohio 45066
Phone: 240.405.6931
Email: plgromen@wildoceans.org
Appt. Confirmed 5/5/08
Confirmed interest in March 2019

Alison A. Bowden
Freshwater Program Director
The Nature Conservancy
205 Portland St, Suite 400
Boston, MA 02114
Phone (day): (617) 227-7017 x351
Phone (eve): (617)678-6135
FAX: (617) 227-7688
Email: abowden@tnc.org
Appt. Confirmed 5/5/08
Confirmed interest in March 2019



ATLANTIC STATES MARINE FISHERIES COMMISSION

Advisory Panel Nomination Form

This form is designed to help nominate Advisors to the Commission’s Species Advisory Panels. The information on the returned form will be provided to the Commission’s relevant species management board or section. Please answer the questions in the categories (All Nominees, Commercial Fisherman, Charter/Headboat Captain, Recreational Fisherman, Dealer/Processor, or Other Interested Parties) that pertain to the nominee’s experience. If the nominee fits into more than one category, answer the questions for all categories that fit the situation. **Also, please fill in the sections which pertain to All Nominees (pages 1 and 2). In addition, nominee signatures are required to verify the provided information (page 4), and Commissioner signatures are requested to verify Commissioner consensus (page 4). Please print and use a black pen.**

Form submitted by: Daniel McKiernan State: MA
(your name)

Name of Nominee: Paul Perra

Address: 5 Candleberry Court

City, State, Zip: Bourne, MA 02532

Please provide the appropriate numbers where the nominee can be reached:

Phone (day): 978-381-4746 Phone (evening): 978-381-4746

FAX: _____ Email: pperra@icloud.com

FOR ALL NOMINEES:

1. Please list, in order of preference, the Advisory Panel for which you are nominating the above person.

1. Shad & River Herring
2. _____
3. _____
4. _____

2. Has the nominee been found in violation of criminal or civil federal fishery law or regulation or convicted of any felony or crime over the last three years?

yes _____ no X

3. Is the nominee a member of any fishermen's organizations or clubs?

yes _____ no X

If "yes," please list them below by name.

4. What kinds (species) of fish and/or shellfish has the nominee fished for during the past year?

Striped Bass

Black Sea Bass

Bluefish

Scup

Summer Flounder

5. What kinds (species) of fish and/or shellfish has the nominee fished for in the past?

American Shad

Winter Flounder

Hickory Shad

Cod

River Herring

Haddock

FOR COMMERCIAL FISHERMEN:

1. How many years has the nominee been the commercial fishing business? _____ years

2. Is the nominee employed only in commercial fishing? yes _____ no _____

3. What is the predominant gear type used by the nominee? _____

4. What is the predominant geographic area fished by the nominee (i.e., inshore, offshore)? _____

FOR CHARTER/HEADBOAT CAPTAINS:

1. How long has the nominee been employed in the charter/headboat business? _____ years

2. Is the nominee employed only in the charter/headboat industry? yes _____ no _____

If "no," please list other type(s) of business(es) and/occupation(s): _____

3. How many years has the nominee lived in the home port community? _____ years

If less than five years, please indicate the nominee's previous home port community.

FOR RECREATIONAL FISHERMEN:

1. How long has the nominee engaged in recreational fishing? 50+ years

2. Is the nominee working, or has the nominee ever worked in any area related to the fishing industry? yes X no _____

If "yes," please explain.

10 years as a marine fisheries researcher on the effects of power plants and oil drilling

on marine fish at Battelle Marine Laboratory, 11 years with ASMFC (1983-94)

working on all its FMPs, and 21 years with NOAA Fisheries in fisheries management.

FOR SEAFOOD PROCESSORS & DEALERS:

1. How long has the nominee been employed in the business of seafood processing/dealing?
_____ years

2. Is the nominee employed only in the business of seafood processing/dealing?

yes _____ no _____ If "no," please list other type(s) of business(es) and/or occupation(s):

3. How many years has the nominee lived in the home port community? _____ years

If less than five years, please indicate the nominee's previous home port community.

FOR OTHER INTERESTED PARTIES:

1. How long has the nominee been interested in fishing and/or fisheries management? _____ years

2. Is the nominee employed in the fishing business or the field of fisheries management?
yes _____ no _____

If "no," please list other type(s) of business(es) and/or occupation(s):

FOR ALL NOMINEES:

In the space provided below, please provide the Commission with any additional information which you feel would assist us in making choosing new Advisors. You may use as many pages as needed.

I am a long-time recreational fisherman (over 50 years) who understands fish biology and fisheries with 32 years of fisheries management experience. I have worked on fisheries management from the State/ASMFC and Federal perspectives, including coordinating the advisory, science, and management groups' input. I have a good understanding of the ASMFC and Federal fisheries management processes. Also, I understand group dynamics and have always worked to help the groups I am part of to identify the facts they base their decisions on and come to consensus if possible.

Nominee Signature: Paul Perra

Date: 5/23/22

Name: Paul Perra
(please print)

COMMISSIONERS SIGN-OFF (not required for non-traditional stakeholders)

Daniel J. McKernan
State Director

Janet M. Peadar
State Legislator

Rapwood N. Kay
Governor's Appointee



ATLANTIC STATES MARINE FISHERIES COMMISSION

Advisory Panel Nomination Form

This form is designed to help nominate Advisors to the Commission’s Species Advisory Panels. The information on the returned form will be provided to the Commission’s relevant species management board or section. Please answer the questions in the categories (All Nominees, Commercial Fisherman, Charter/Headboat Captain, Recreational Fisherman, Dealer/Processor, or Other Interested Parties) that pertain to the nominee’s experience. If the nominee fits into more than one category, answer the questions for all categories that fit the situation. **Also, please fill in the sections which pertain to All Nominees (pages 1 and 2). In addition, nominee signatures are required to verify the provided information (page 4), and Commissioner signatures are requested to verify Commissioner consensus (page 4). Please print and use a black pen.**

Form submitted by: Daniel McKiernan State: MA
(your name)

Name of Nominee: Jerry Audet

Address: 286 Yew St.

City, State, Zip: Douglas, MA 01516

Please provide the appropriate numbers where the nominee can be reached:

Phone (day): 304 906 1298

Phone (evening): 304 906 1298

FAX: _____

Email: indeepoutdoorsmedia@gmail.com

FOR ALL NOMINEES:

1. Please list, in order of preference, the Advisory Panel for which you are nominating the above person.

- 1. Shad & River Herring
- 2. _____
- 3. _____
- 4. _____

2. Has the nominee been found in violation of criminal or civil federal fishery law or regulation or convicted of any felony or crime over the last three years?

yes _____ no X

3. Is the nominee a member of any fishermen's organizations or clubs?

yes _____ no **X** _____

If "yes," please list them below by name.

I am not officially part of any organization or club

4. What kinds (species) of fish and/or shellfish has the nominee fished for during the past year?

Striped Bass

Bluefish/weakfish/fluke

Shad

Salmon

Large/Smallmouth Bass

Brook/Brown Trout

5. What kinds (species) of fish and/or shellfish has the nominee fished for in the past?

The list is far too long for this document

I've fished all over the USA, both fresh and salt

FOR COMMERCIAL FISHERMEN:

1. How many years has the nominee been the commercial fishing business? _____ years

2. Is the nominee employed only in commercial fishing? yes _____ no _____

3. What is the predominant gear type used by the nominee? _____

4. What is the predominant geographic area fished by the nominee (i.e., inshore, offshore)? _____

FOR CHARTER/HEADBOAT CAPTAINS:

1. How long has the nominee been employed in the charter/headboat business? _____ years

2. Is the nominee employed only in the charter/headboat industry? yes _____ no _____

If "no," please list other type(s) of business(es) and/occupation(s): _____

3. How many years has the nominee lived in the home port community? _____ years

If less than five years, please indicate the nominee's previous home port community.

FOR RECREATIONAL FISHERMEN:

1. How long has the nominee engaged in recreational fishing? 30+ _____ years

2. Is the nominee working, or has the nominee ever worked in any area related to the fishing industry? yes _____ no _____

If "yes," please explain.

Please see attached document.

I am a full-time fishing writer and photographer.

I am also the Managing Editor of Surfcaster's Journal Magazine

FOR SEAFOOD PROCESSORS & DEALERS:

1. How long has the nominee been employed in the business of seafood processing/dealing? _____ years

2. Is the nominee employed only in the business of seafood processing/dealing?

yes _____ no _____ If "no," please list other type(s) of business(es) and/or occupation(s):

3. How many years has the nominee lived in the home port community? _____ years

If less than five years, please indicate the nominee's previous home port community.

FOR OTHER INTERESTED PARTIES:

1. How long has the nominee been interested in fishing and/or fisheries management? _____ years

2. Is the nominee employed in the fishing business or the field of fisheries management?
yes _____ no _____

If "no," please list other type(s) of business(es) and/or occupation(s):

FOR ALL NOMINEES:

In the space provided below, please provide the Commission with any additional information which you feel would assist us in making choosing new Advisors. You may use as many pages as needed.

Please see the attached document.

Nominee Signature: *Jerry Audet*

Date: 6/27/2022

Name: Jerry Audet
(please print)

COMMISSIONERS SIGN-OFF (not required for non-traditional stakeholders)

Daniel J. McLeeran

State Director

Garth W. Redke

State Legislator

Raymond W. Kauf

Governor's Appointee

Jerry Audet

Supplemental Information for ASMFC Advisory Panel Nomination Form

Relevant Training/Work/Life Experience

- **Formal Scientific Training.** I have extensive and diverse experience as a scientist. I am formally trained as an integrative physiologist, and have a more than a decade of experience in molecular biology, protein analysis, and physiological performance. I have been involved in many different studies, across multiple research areas including: dragonfly speciation, genetically modified animal models, human athletic performance, chronic disease diagnosis and treatment (including POC devices), and military environmental threats. I've published 10 peer-reviewed scientific manuscripts (6-first author), 35+ scientific abstracts, presented research at several national meetings, and applied for and secured grant funding. I have also done college-level teaching and tutoring, and I also worked as a formal scientific/medical manuscript editor.
- **Professional Fishing Writer and Photographer.** For the last seven-years I have slowly moved from a part-time hobbyist fishing writer and photographer, to full time freelancer. Starting in 2021, this has become my full time job. I currently have well over 120 fishing articles published and 400 photos. I have seven magazine covers and one book cover. I have written for many magazines (e.g. Field and Stream, Anglers Journal, On the Water, The Fisherman, etc.), companies (e.g. Lamiglas Rods), and small businesses (e.g. The Saltwater Edge). I currently primarily write about and photograph angling for striped bass, trout, and bass from shore, kayak, and canoe.
- **Managing Editor, Surfcasters Journal.** I took over as Managing Editor for *Surfcasters Journal* Magazine in May of 2021. As Managing Editor, I play many roles. Primarily I split most of my effort between collecting content- talking and emailing with many angler-authors up and down the coast (and across the world)- and editing and formatting articles, stories, photographs, and videos. I also do all the gear reviews and have a column. In this role, I am exposed to hundreds of fishing reports and thousands of anglers- mostly for New England, but I hear from anglers up and down the Atlantic coast. This information usually consists of when and where anglers are encountering fish, migration stages, presences of bait, what types of bait the fish are on, etc. While this is all anecdotal information, it does provide a finger on the pulse of several fisheries (both predators and prey) that would benefit the Commission. This is a part time position.
- **Passionate, Multi-disciplined Angler.** I have been fishing since I was 5- or 6-years old (I'm 37 now). I grew up fishing for trout and bass with my grandfather and father in New York, Vermont, and Maine. In my early 20's I discovered surf fishing and the rest is history. I currently fish about 200 days/nights a year, with about 120-130 of those being in the surf for striped bass, primarily in Massachusetts and Rhode Island. However, I travel from New York to Maine every season in my pursuit of striped bass and trout. I fish with both lures and flies, and I have fished all over the country, but primarily the East Coast from the Outer Banks of North Carolina to Washington County, Maine. My entire life has become fishing over the last decade, as I transitioned away from science and into the writing and photography world. I am passionate about fishing on a deeply personal level, and love capturing and sharing all that encompasses the experience of pursuing the fish we love, in the places we love.

- **Engaged in Fisheries Management.** While not in any official position, I have become highly engaged in the management process of the striped bass over the last five-years. I follow the process carefully, and have attended many hearings, in person and on Zoom, and have written, edited, and published editorials (in multiple publications) about the state of the fishery and the process. I attend all the ASMFC meetings virtually. I field questions regularly from other anglers via email and social media about the state of the fishery, how to get involved, and updates to the process. I have attended private organization meetings concerning striped bass management in the past. This has sparked my interest in becoming more officially involved with fisheries management. Given my experience and interests (both professionally and personally), the shad and river herring AP seems like a great fit, but I am open to serving as the commission deems fit.
- **Reasonable, Logical, and a Team-player.** I understand that fisheries management involves many parties with a diverse set of expectations, roles, and requirements. I primarily want what is best for the resource and understand that this may mean not all parties are always happy. I am focused on facts, and the science, but understand that there is nuance as well. I am not afraid to voice my opinion, but am a good listener and enjoy collaborating with others.

Formal Details

Education

Green Mountain College: Bachelors of Science in Biology, Minor Chemistry

- Graduated with Honors
- Summa Cum laude

West Virginia University School of Medicine: Doctorate in Exercise Physiology

- Thesis: "Thrombospondin-1: an emerging keystone in skeletal muscle angiogenesis"
- Awarded with Outstanding Doctorate Degree

Relevant Employment History

2013-2017, Post-Doctoral Fellow, United States Army Research Institute of Environmental Medicine

2017, Federal Research Scientist, United States Army Research Institute of Environmental Medicine

2019, Scientific & Medical Editor, Cactus Communications

2016-Current, Full-Time Freelance Writer and Photographer (Fishing, Outdoors)

2021-Current, Managing Editor, Surfcasters Journal Magazine

Availability

I have a highly flexible schedule and work 100% remote.

Atlantic States Marine Fisheries Commission

Coastal Pelagics Management Board

*November 8, 2022
10:45 a.m. – 12:15 p.m.
Hybrid Meeting*

Draft Agenda

The times listed are approximate; the order in which these items will be taken is subject to change; other items may be added as necessary.

1. Welcome/Call to Order (*J. Cimino*) 10:45 a.m.
2. Board Consent 10:45 a.m.
 - Approval of Agenda
 - Approval of Proceedings from May 2022
3. Public Comment 10:50 a.m.
4. Update on 2022 Spanish Mackerel Stock Assessment and Peer Review 11:00 a.m.
 - Presentation of 2022 Stock Assessment Update to Date (*J. Carmichael*)
 - Presentation of 2022 Assessment Peer Review Report and Response from the South Atlantic Fishery Management Council (*J. Carmichael*)
5. Review Differences Between the Interstate Fishery Management Plan (FMP) and Federal FMP for Spanish Mackerel (*E. Franke*) 11:40 a.m.
6. Consider Fishery Management Plan Reviews and State Compliance for the 2021 Fishing Year (*E. Franke*) **Action** 11:55 a.m.
 - Spanish Mackerel
 - Atlantic Cobia
7. Other Business/Adjourn 12:15 p.m.

The meeting will be held at The Ocean Place Resort (1 Ocean Boulevard Long Branch, NJ; 732.571.4000) and via webinar; click [here](#) for details

MEETING OVERVIEW

Coastal Pelagics Management Board

November 8, 2022

10:45 a.m. – 12:15 p.m.

Hybrid

Chair: Joe Cimino (NJ) Assumed Chairmanship: 11/21	Technical Committee Chair: Cobia: Angela Giuliano (MD)	Law Enforcement Committee Rep: Capt. Chris Hodge (GA)
Vice Chair: Erika Burgess (FL)	Advisory Panel Chair: Craig Freeman (VA)	Previous Board Meeting: May 2, 2022
Voting Members: RI, NY, NJ, DE, MD, PRFC, VA, NC, SC, GA, FL, SAFMC, NMFS (13 votes)		

2. Board Consent

- Approval of Agenda
- Approval of Proceedings from May 2022

3. Public Comment – At the beginning of the meeting, public comment will be taken on items not on the agenda. Individuals that wish to speak at this time must sign-in at the beginning of the meeting. For agenda items that have already gone out for public hearing and/or have had a public comment period that has closed, the Board Chair may determine that additional public comment will not provide additional information. In this circumstance, the Chair will not allow additional public comment on an issue. For agenda items that the public has not had a chance to provide input, the Board Chair may allow limited opportunity for comment. The Board Chair has the discretion to limit the number of speakers and/or the length of each comment.

4. Update on 2022 Spanish Mackerel Stock Assessment and Peer Review (11:00-11:40 a.m.)

Background

- The 2022 operational stock assessment for Atlantic Spanish mackerel (SEDAR 78) was completed in May 2022 (**Briefing Materials**).
- The South Atlantic Fishery Management Council's (SAFMC) Scientific and Statistical Committee (SSC) reviewed SEDAR 78 in August 2022 and submitted their report for SAFMC consideration in September 2022 (**Briefing Materials**).
- SEDAR 78 is currently undergoing additional review and analysis before being considered for management use.

Presentations

- Assessment overview to date by J. Carmichael
- Peer review summary and SAFMC response by J. Carmichael

5. Differences Between the Interstate and Federal FMPs for Spanish Mackerel (11:40-11:55 a.m.)

Background

- Differences between the Interstate and Federal FMPs for Spanish mackerel exist in terms of commercial management zones, commercial trip limits and closures, allowable gears, recreational season, and recreational accountability measures.
- The Board discussed these differences in February 2020, and postponed considering action to address these differences until completion of the 2022 stock assessment for Spanish mackerel.

Presentations

- Overview of management differences by E. Franke

6. Fishery Management Plan Reviews (11:55 a.m.-12:15 p.m.) Action

Background

- State Compliance Reports for Atlantic cobia were due on July 1, 2022.
- The Cobia Plan Review Team (PRT) reviewed each state report and compiled the annual FMP Review (**Briefing Materials**).
- The Cobia PRT recommends the Board approve all *de minimis* requests from Rhode Island, New Jersey, Delaware, Maryland, Georgia, and Florida.
- State Compliance Reports for Spanish mackerel were due on October 1, 2022.
- The Spanish Mackerel PRT reviewed each state report and compiled the annual FMP Review (**Supplemental Materials**).
- Rhode Island, New Jersey, and Delaware have requested and meet the requirements for *de minimis* for Spanish mackerel.

Presentations

- Overview of the FMP Review Reports by E. Franke

Board actions for consideration at this meeting

- Accept 2022 FMP Reviews and State Compliance Reports for Spanish mackerel and Atlantic cobia.
- Approve *de minimis* requests for Spanish mackerel and Atlantic cobia.

7. Other Business/Adjourn (12:15 p.m.)

Coastal Pelagics Board

Activity level: Moderate

Committee Overlap Score: Moderate

Committee Task List

- Cobia TC – Develop specification recommendations for the next quota block
- Cobia TC/PRT – July 1: Compliance Reports Due
- Spanish Mackerel PRT – October 1: Compliance Reports Due

Technical Committee Members:

Cobia TC: Angela Giuliano (MD, Chair), Nichole Ares (RI), Brian Neilan (NJ), Somers Smott (VA), Michael Loeffler (NC), Justin Yost (SC), Chris Kalinowsky (GA), Christina Wiegand (SAFMC), Michael Larkin (SERO), Emilie Franke (ASMFC)

Plan Review Team Members:

Cobia PRT: Angela Giuliano (MD), Somers Smott (VA), Chris McDonough (SC), Emilie Franke (ASMFC)
Spanish Mackerel PRT: McLean Seward (NC), BJ Hilton (GA), Chris Swanson (FL), Christina Wiegand (SAFMC), John Hadley (SAFMC), Emilie Franke (ASMFC)

**DRAFT PROCEEDINGS OF THE
ATLANTIC STATES MARINE FISHERIES COMMISSION
COASTAL PELAGICS MANAGEMENT BOARD**

**The Westin Crystal City
Arlington, Virginia**

May 2, 2022

These minutes are draft and subject to approval by the Coastal Pelagics Management Board.
The Board will review the minutes during its next meeting.

Draft Proceedings of the Coastal Pelagics Management Board
May 2022

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Updates on Spanish Mackerel Stock Assessment Timeline and Federal Waters Management	4
Elect Vice-Chair.....	5
Adjournment	5

These minutes are draft and subject to approval by the Coastal Pelagics Management Board.
The Board will review the minutes during its next meeting.

INDEX OF MOTIONS

1. **Approval of Agenda** by consent (Page 1).
2. **Approval of South Atlantic Board Proceedings** of October 2020 by consent (Page 1).
3. **Move to change the cobia quota block timeframe from 2020-2022 to 2021-2023 for the current annual total harvest quota of 80,112 fish, thereby setting the 2023 cobia harvest quota at 80,112 fish, resulting in a coastwide recreational quota of 76,908 fish and commercial quota of 73,116 pounds** (Page 4). Motion by Shanna Madsen; second by Lynn Fegley. Motion approved by consent (Page 4).
4. **Move to elect Erika Burgess as the Vice-Chair of the Coastal Pelagics Management Board** (Page 5). Motion by Doug Haymans; second by Pat Geer. Motion approved by consent (Page 5).
5. **Motion to adjourn** by consent (Page 5).

Draft Proceedings of the Coastal Pelagics Management Board
May 2022

ATTENDANCE

Board Members

Jason McNamee, RI (AA)	Jerry Mannen, NC (GA)
Eric Reid, RI, proxy for Sen. Sosnowski (LA)	Bill Gorham, NC, proxy for Sen. Steinburg (LA)
Joe Cimino, NJ (AA)	Mel Bell, SC (AA)
Peter Clarke, NJ, proxy for T. Fote (GA)	Malcolm Rhodes, SC (GA)
John Clark, DE (AA)	Chris McDonough, SC, proxy for Sen. Cromer (LA)
Roy Miller, DE (GA)	Doug Haymans, GA (AA)
Lynn Fegley, MD, Administrative proxy	Spud Woodward, GA (GA)
Russell Dize, MD (GA)	Hannah Hart, FL, proxy for J. McCawley (AA)
David Sikorski, MD, proxy for Del. Stein (LA)	Marty Gary, PRFC
Pat Geer, VA, Administrative proxy	John Carmichael, SAFMC
Shanna Madsen, VA, proxy for Sen. Mason (LA)	Andy Strelcheck, NMFS
Chris Batsavage, NC, proxy for K. Rawls (AA)	

(AA = Administrative Appointee; GA = Governor Appointee; LA = Legislative Appointee)

Ex-Officio Members

Angela Giuliano, Cobia Technical Committee Chair

Staff

Robert Beal	Katie Drew	Dustin Colson Leaning
Toni Kerns	Emilie Franke	Sarah Murray
Tina Berger	Lisa Havel	Trevor Scheffel
Kristen Anstead	Chris Jacobs	Gabe Thompson
Tracey Bauer	Jeff Kipp	

Guests

Max Appelman, NOAA	Jesse Hornstein, NYS DEC	Harry Rickabaugh, MD DNR
Pat Augustine, Coram, NY	Kathleen Howington, SAFMC	Amy Schueller, NOAA
Joey Ballenger, SC DNR	Adam Kenyon, VMRC	Chris Scott, NYS DEC
Alan Bianchi, NC DENR	Kathy Knowlton, GA DNR	Alexei Sharov, MD DNR
Karen Bradbury, Ofc Sen. Whitehouse	Tom Lilly	Ethan Simpson, VMRC
Bill Brantley, NC DENR	Mike Luisi, MD DNR	Somers Smott, VMRC
Jeff Brust, NJ DEP	Dee Lupton, NC DMF	Renee St. Amand, CT DEEP
Steve Doctor, MD DNR	Jack McGovern, NOAA	Wes Wolfe, <i>Florida Politics</i>
Anthony Friedrich, SGA	Thomas Newman	Chris Wright, NOAA
Lewis Gillingham, VMRC	Willow Patten, NC DENR	Eric Zlokovitz, MD DNR
	Kathy Rawls, NC DMR	

These minutes are draft and subject to approval by the Coastal Pelagics Management Board.
The Board will review the minutes during its next meeting.

Draft Proceedings of the Coastal Pelagics Management Board Webinar
May 2022

The Coastal Pelagics Management Board of the Atlantic States Marine Fisheries Commission convened in the Jefferson Ballroom of the Westin Crystal City Hotel, Arlington, Virginia, a hybrid meeting, in-person and webinar; Monday, May 2, 2021 and was called to order at 1:00 p.m. by Chair Joe Cimino.

CALL TO ORDER

CHAIR JOE CIMINO: We are ready to get started here with our newest of ASMFC management boards, this is the first meeting of the Coastal Pelagics Management Board, I'm the new Chair. My name is Joe Cimino; I'm the Administrative Commissioner from New Jersey. I have with me from staff Emilie Franke and Angela Giuliano, who is the Chair of the TC from Maryland.

We have a couple items to go through. I think we should be able to get through our agenda quite easily. We'll have a presentation from Angela on the TC recommendations.

APPROVAL OF AGENDA

CHAIR CIMINO: To get started we'll go through the approval of the agenda. Are there any additions, or issues with the agenda as is? Not seeing any hands, we'll approve the agenda by consent.

APPROVAL OF PROCEEDINGS

CHAIR CIMINO: Approval of the proceedings from the October, 2020 meeting, again this is when it was a joint meeting of the South Atlantic. Any issues with the proceedings from the October, 2020 meeting? Okay, if not again, we'll consider that approved by consent.

PUBLIC COMMENT

CHAIR CIMINO: I'll take public comment on any items not on the agenda.

We have a possible action item following this. Once we get a motion for that action item, I'll allow public comment on that motion. This public

comment period would just be on anything not on the agenda. Great, no hands, so we'll move on.

CONSIDER QUOTA BLOCK TIMEFRAME FOR COBIA

CHAIR CIMINO: Again, we'll be listening to the Technical Committee report for the consideration for possibly new Quota Block Timeframe for cobia. We're going to turn it right over to Angela.

TECHNICAL COMMITTEE REPORT

MS. ANGELA GIULIANO: Hi, as Joe said, my name is Angela Giuliano, and I work for the Maryland Department of Natural Resources. I'll be reviewing the Technical Committee report on the Quota Block recommendation. Just as an overview, because it's been a while since we've all met. I'll first go through a history of the current harvest specifications, including Amendment 1, then followed by Addendum I.

I'll review the two options that the Technical Committee discussed, as well as the data we considered when making our recommendation, and then going to the recommendation itself. As some background information on Amendment 1, Section 4.1 is where it describes the harvest specification process. The Board can set the total harvest quota, vessel limits, possession or bag limits, minimum size limits and the commercial closure trigger through the harvest specification process. The Board is able to set these for up to three years. A new specification should be implemented either after previous specifications have expired, or a new stock assessment is available. Then Amendment 1 also specifies that the harvest specification should occur no later than the fall meeting to be implemented the following year.

After the last stock assessment is when we set the current quota block for 2020 through 2022, and the Board at that time set the quota at 80,112 fish, which corresponded to about 2.4 million pounds per year. Following Amendment 1, this was allocated 92 percent to the recreational sector and 8 percent to the commercial sector.

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You'll see the table here that shows the various quota options that at that time were considered by the Board, based off of projections provided by the Southeast Fishery Science Center following the last assessment. When the TC was doing these recommendations at that time, the focus was really on the probability of being overfished.

The projections went out through 2024, and as you can see that row highlighted in yellow is what was ultimately chosen by the Board as quota. That was the maximum recommended by the Technical Committee, and had a probability of being overfished of 0.25 by 2024, assuming 2.4 million pounds constantly caught each year.

Following setting of the quota, Addendum I was initiated, basically to reevaluate the allocation between the recreational and commercial sectors following a change in the MRIP estimates that incorporated the fishing effort survey. In 2021 the allocation changed to 96 percent recreational and 4 percent commercial.

However, the previously agreed upon quota of 80,112 fish remained the same. These changes in the quota became effective January 1st of 2021. Following these changes, a few of the states evaluated their landings relative to the new quota levels, and submitted new regulations to conform to their new soft recreational targets.

Specifically in Virginia, they reduced their harvest 42 percent, and North Carolina liberalized their regulations for private recreational anglers. In addition, some of the de minimis states changed their regulations as well in 2021, either moving to match Virginia's regulations, or implementing the new de minimis option that was provided in Addendum I.

There were two options considered by the Technical Committee for the Board meeting today. The first would be to maintain the 2020 through 2022 quota block. Basically, if this option were chosen, the Technical Committee would develop specification options for a new quota for the 2023

through 2025 fishing seasons during the summer of 2022.

These would be presented to the Board for their consideration at their fall 2022 meeting. Given all the management changes, however, that occurred in 2021, the other option would be to change the quota block to 2021 through 2023. If this option were chosen by the Board, the current total quota of 80,112 fish would remain the same for the 2023 fishing season. This would align with the new sector allocations and regulations implemented by some states in 2021. If this option were chosen, the Technical Committee would meet in the summer of 2023, to develop specification options for the 2024 through 2026 seasons. As the TC considered these two options, we first reviewed the previous projections that had been done following the last stock assessment, as well as we discussed the timing of the next stock assessment.

SEDAR 58 had a terminal year of 2017, and was accepted for management use in 2020. The next SEDAR assessment, which would be an update assessment is tentatively scheduled for 2025, which means the terminal year would likely be either 2023 or 2024, and it would likely be available to inform management in 2026.

We did reach out to the Southeast Fishery Science Center about extending any projections past 2024 being we would be setting quotas for a couple years without the projection available. They recommended against it, just because of the increasing uncertainty past the terminal year. However, the Technical Committee could request updated projections if there are particular concerns with the stock, either perceived changes in abundance, or if we want to incorporate more recent landings and discard information.

The second piece of information that the Technical Committee considered is where harvest has actually been, relative to the 2.4 million pounds used in the projections previously. As you can see from this table here. In 2019 and 2020, between the commercial and recreational sectors, we are

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probably a little bit under 2.4 million pounds, 2021s landings are not complete at this point.

Final commercial landings won't be available until compliance reports are submitted in July. However, as you can see, even just looking at the MRIP estimate of pounds at this point, we are going to be over 2.4 million pounds. However, despite this variability the average over those three years is just under 2.4 million pounds, which is what those projections were assuming.

At this point the Technical Committee did not think it would be useful to update the projections at this point. With these considerations, the Technical Committee is recommending to change the quota block to 2021 to 2023. This aligns with the new sector allocation and the new regulations implemented by states in 2021.

When we go to evaluate states landings against their projected soft target, this would allow us to incorporate two years of consistent regulatory period. Moving the quota block is not expected to be a risk to the stock, given it was set fairly conservatively to begin with. As I mentioned before, the medium probability of being overfished was 0.25 in the terminal year of the projection, which was 2024.

As I just mentioned, while the individual year landings have been variable, the average harvest is about where we were in those projections conducted previously. As I mentioned previously, if the Board chooses to adopt this quota block, the Technical Committee plans to meet in 2023 to develop options for your consideration for the next quota block quota.

We would continue to monitor 2022 landings, to determine if there is a need to update the projections through 2024. If 2022s landings look similar to 2021, where they're much higher than 2.4 million pounds, we would probably go back to the Southeast Fishery Science Center and request some updated projections. As mentioned previously, these would be brought no later than the fall board

meeting in 2023 for the Board's consideration to set for the 2024 fishing year. While we were having these discussions there were some general recommendations from the Technical Committee, just regarding future specification and assessments.

The first just being sure to monitor year to year changes and variability in state landings, as well as to continue to evaluate new data on overlap of the Atlantic and Gulf Coast stocks off of the Atlantic Coast of Florida, as new data becomes available. With that I will take any questions.

CHAIR CIMINO: Great, thank you, Angela. Any questions for Angela on the TCs recommendation? Yes, go ahead, Chris.

MR. CHRIS McDONOUGH: Just to clarify your update. If they had to update the projections, you're really only talking about updating one or two years beyond on the projections, one year?

MS. GIULIANO: Yes, so at the end of that last assessment we had the Southeast Fishery Science Center use, I think at that time 2018 landings had been finalized, and they use, I think a three-year average for 2019 estimate of landings. Then it was set at 2.4 million pounds for 2020 through 2024. We would be able to update what '19, '20, '21, '22, so yes it would be a few years updated.

**CONSIDER CHANGES TO THE THREE-YEAR QUOTA
BLOCK FOR COBIA HARVEST SPECIFICATIONS**

CHAIR CIMINO: Okay, any other questions? Okay, fairly straightforward. We have a recommendation from the TC. I would hope we could see a motion on this to move this forward. Does anyone have a motion on this? Shanna, go ahead.

MS. SHANNA MADSEN: I would like to move that we take the TC recommendation of changing the cobia quota block to a timeframe of 2021 through 2023.

CHAIR CIMINO: Thanks, Shanna, get that up and then I'll ask for a second. Okay, there we are, Lynn,

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is that a second? Okay, thank you. We have a motion and a second. Roy, we see you online, was your hand to second this?

MR. ROY W. MILLER: It was, Mr. Chairman.

CHAIR CIMINO: Okay, thank you.

MS. EMILIE FRANKE: To the maker of the motion, just as a friendly request from staff. If we could specify in the motion that accepting that quota block would set the quota for 2023 at the current quota level, with that suggested language on the screen, if that would be okay with the maker and the seconder.

MS. MADSEN: That's fine with me, I can read this into the record too as well. I didn't realize you guys had one crafted already. **Okay, so I would like to move to change the cobia quota block timeframe from 2020 to 2022, to 2021 to 2023 for the current annual total harvest quota of 80,112 fish, thereby setting the 2023 cobia harvest quota at 80,112 fish, resulting in a coastwide recreational quota of 76,908 fish, and a commercial quota of 73,116 pounds.**

CHAIR CIMINO: Thank you, Shanna, that's a motion by Shanna Madsen, second by Lynn Fegley. Any discussion on the motion? Okay, no hands, again, this is pretty straightforward, so I'm just going to ask, is there any objection to the motion? Not seeing any hands that's great. **We'll consider that motion passed by consent**, and we will move on to the other species for this new Board.

**UPDATES ON SPANISH MACKEREL
STOCK ASSESSMENT TIMELINE AND
FEDERAL WATERS MANAGEMENT**

CHAIR CIMINO: I'll turn it over to Emilie to talk Spanish mackerel for both the assessment and to give us some information on what is happening with management south of us.

MS. FRANKE: I just have two very brief updates on Spanish mackerel that were provided to us by South

Atlantic Council staff and SEDAR staff. Again, the first is just on the stock assessment timeline for the next Spanish mackerel assessment, and the second is just an update on the management in federal waters, and a recent amendment from the South Atlantic Council.

As far as the stock assessment, the SEDAR 78 report for the Atlantic Spanish mackerel stock is actually now available online as of today, so that report was just released. The South Atlantic Fishery Management Council Scientific and Statistical Committee will review those SEDAR 78 results at their summer meeting, and discuss recommendations.

The South Atlantic Council will then review the assessment and the SSC recommendations at their September Council meeting. Just a brief update on that upcoming information on the Spanish mackerel stock. Then as far as federal waters management, Amendment 34 to the Federal Coastal Migratory Pelagic FMP was just approved by the South Atlantic Council and the Gulf of Mexico Council in March and April of this year, and Council staff are currently working to finalize that Amendment to be transmitted to NOAA.

That Amendment would allow cut off or damaged Spanish mackerel that are caught under the recreational bag limit and that complies with the minimum size limit, to be possessed and offloaded ashore. For this Amendment, damaged refers to Spanish mackerel that have been damaged due to predation. That is all, just quick updates. I might be able to answer a few questions. We also have SEDAR staff on the line, and if anyone else from the Council would like to add anything, go ahead.

CHAIR CIMINO: Yes, we have the Executive Director, so Mr. Carmichael, if you wouldn't mind giving us a little more information on that report.

EXECUTIVE DIRECTOR JOHN CARMICHAEL: Yes, thank you. It's great that the assessment came out to day, so time for the Board and what you guys summarized is absolutely correct. We're looking at

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probably mid to late July right now for the SSC meeting. It will be a webinar meeting.

We can certainly let ASMFC know that is going on, because I imagine some folks from the Technical Committee and others might want to listen in to those discussions. The intent is that they will prove the ABC. That will go to the Council in September. It will go to the Advisory Panel in the fall, probably October.

Then back to the Council in December, and they'll start talking about the response. It will be a big topic of discussion during 2023. Hopefully a year, year and a half to get it in and get it approved. We're not anticipating statutory deadlines related to overfished or overfishing, at least based on the preliminary look at the assessment. That will certainly help us out with getting it done.

CHAIR CIMINO: Great, thanks, John. Question from Chris Batsavage.

MR. CHRIS BATSAVAGE: Thank you, Emilie for the update, and John for the detailed kind of timeline, as far as where this is going through the South Atlantic Council. Will this Board also receive a presentation on the stock assessment, either later this fall or early next year?

MS. FRANKE: We can work with Council staff and SEDAR staff to try to get something lined up for a future board meeting.

CHAIR CIMINO: I don't see any other questions. Did that wrap us up for Spanish? Okay.

ELECT VICE-CHAIR

CHAIR CIMINO: We have one other item on the agenda that we'll need action on, and that is electing a Vice-Chair. Doug.

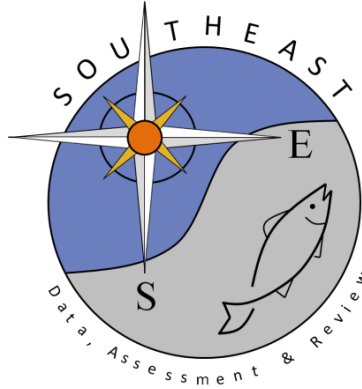
MR. DOUG HAYMANS: I would like to nominate Erika Burgess from the great state of Florida Chair, as the Vice-Chair, excuse me.

CHAIR CIMINO: **We have a nomination for Erika Burgess of Florida. I see some hands, I'm assuming those are hands in support, very good, thank you.** This is how we do things. Erika is not able to be here, so she is fairly in. Sorry, she knew ahead of time, don't worry about it.

ADJOURNMENT

CHAIR CIMINO: Any other business to come before the Board today? Okay, no hands, very good. I appreciate everyone's time today. Thank you to staff and Angela for all the help in getting us through this.

(Whereupon the meeting convened at 1:21 p.m. on Monday May 2, 2022.)



SEDAR

Southeast Data, Assessment, and Review

SEDAR 78

South Atlantic Spanish Mackerel

Stock Assessment Report

May 2022

Revised July 2022

SEDAR
4055 Faber Place Drive, Suite 201 North Charleston, SC 29405

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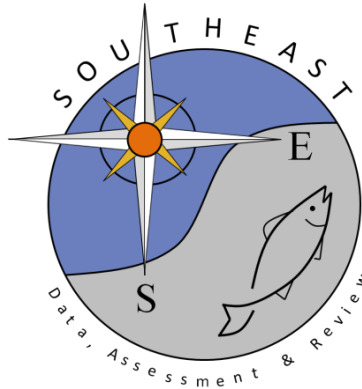
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SEDAR

Southeast Data, Assessment, and Review

SEDAR 78

South Atlantic Spanish Mackerel

Section I: Introduction

May 2022

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I. Introduction

1. SEDAR Process Description

SouthEast Data, Assessment, and Review (SEDAR) is a cooperative Fishery Management Council process initiated in 2002 to improve the quality and reliability of fishery stock assessments in the South Atlantic, Gulf of Mexico, and US Caribbean. The improved stock assessments from the SEDAR process provide higher quality information to address fishery management issues. SEDAR emphasizes constituent and stakeholder participation in assessment development, transparency in the assessment process, and a rigorous and independent scientific review of completed stock assessments.

SEDAR is managed by the Caribbean, Gulf of Mexico, and South Atlantic Regional Fishery Management Councils in coordination with NOAA Fisheries and the Atlantic and Gulf States Marine Fisheries Commissions. Oversight is provided by a Steering Committee composed of NOAA Fisheries representatives: Southeast Fisheries Science Center Director and the Southeast Regional Administrator; Regional Council representatives: Executive Directors and Chairs of the South Atlantic, Gulf of Mexico, and Caribbean Fishery Management Councils; a representative from the Highly Migratory Species Division of NOAA Fisheries; and Interstate Commission representatives: Executive Directors of the Atlantic States and Gulf States Marine Fisheries Commissions.

SEDAR 78 addressed the stock assessment for South Atlantic Spanish Mackerel. The assessment process consisted of a series of webinars held from May 2021 – March 2022. The Stock Assessment Report is organized into 2 sections. Section I –Introduction contains a brief description of the SEDAR Process, Assessment and Management Histories for the species of interest, and the management specifications requested by the Cooperator. Section II is the Assessment Process report. This section details the assessment model, as well as documents any data recommendations that arise for new data sets presented during this assessment process, or changes to data sets used previously.

The final Stock Assessment Reports (SAR) for South Atlantic Spanish Mackerel was disseminated to the public in May 2022. The Council’s Scientific and Statistical Committee (SSC) will review the SAR for its stock. The SSCs are tasked with recommending whether the assessments represent Best Available Science, whether the results presented in the SARs are useful for providing management advice and developing fishing level recommendations for the Council. An SSC may request additional analyses be conducted or may use the information provided in the SAR as the basis for their Fishing Level Recommendations (e.g., Overfishing Limit and Acceptable Biological Catch). The South Atlantic Fishery Management Council’s SSC will review the assessment at its Summer 2022 meeting, followed by the Council receiving the SAR at the Fall 2022 meeting. Documentation on SSC recommendations is not part of the SEDAR process and is handled through each Council

2. Atlantic Spanish Mackerel Management Overview

2.1 Fishery Management Plan and Amendments

The following summary describes only those management actions that likely affect Atlantic Spanish mackerel fisheries and harvest.

FMP Amendments affecting Atlantic Spanish mackerel:

Description of Action	Amendment	Effective Date
<ul style="list-style-type: none"> • Set MSY = OY = TAC (27,000,000 pounds). • Minimum size limit for is 12 inches FL, except for incidental catch allowance of 5% of the total catch by weight aboard. 	Original FMP (SAFMC 1982) 48 FR 5274	February 4, 1983
<ul style="list-style-type: none"> • Provided framework procedure for pre-season adjustment of TAC. • TAC = 27,000,000 pounds • Limited purse seine harvest to 300,000 lbs in Atlantic and 300,000 lbs in Gulf • Minimum size limit for the commercial and recreational sectors are 12 inches FL or 14 inches TL. 	Amendment 1 (SAFMC 1985) 50 FR 34846	August 28, 1985
<ul style="list-style-type: none"> • Revised MSY and clarified TAC must be set below the upper range of the ABC. • Recognized two migratory groups, Gulf and South Atlantic, with Dade/Monroe county line as the migratory group boundary. • TAC = 2,900,000 pounds • Established allocations for TAC, commercial (2,200,000 pounds, 76%) and recreational (700,000 pounds, 24%). • Established April 1 to March 31 fishing year. • Recreational bag limit of 4 fish in FL and 10 in NC, SC, and GA. • Charter boat permits were required. 	Amendment 2 (SAFMC 1987) 52 FR 23836	June 25, 1987

Description of Action	Amendment	Effective Date
<ul style="list-style-type: none"> • Prohibited drift gill nets for coastal pelagics and purse seines for the overfished group of mackerels. 	Amendment 3 (SAFMC 1989) 54 FR 29561	July 13, 1989
<ul style="list-style-type: none"> • Reallocated Atlantic group Spanish mackerel equally between recreational and commercial fishermen. • TAC = 6,000,000 	Amendment 4 (SAFMC 1989) 54 FR 38526	September 19, 1989
<ul style="list-style-type: none"> • Extended the management area for the Atlantic groups of mackerels through the Mid Atlantic Fishery Management Council’s area of jurisdiction. • Revised the definition of overfishing. • Redefined recreational bag limits as daily limits, and removed the provision specifying that bag limit caught mackerel may be sold. • Size limit for Spanish mackerel is 12 “ FL or 14” TL. • Bag limit is 4 fish off FL and 10 fish north of FL. 	Amendment 5 (SAFMC 1990) 55 FR 29370	July 19, 1990

Description of Action	Amendment	Effective Date
<ul style="list-style-type: none"> • Specified rebuilding periods for overfished mackerel stocks. • Provided for commercial Atlantic Spanish mackerel possession limits. <ul style="list-style-type: none"> • In the northern zone, boats are restricted to possession limits of 3,500 pounds. In the southern zone trip limit are 1,500 pounds per vessel per day from April 1 to November 30. From December 1 until 80% of quota is taken: unlimited harvest on Monday, Wednesday, and Friday; 1,500 pounds per vessel per day on Tuesday and Thursday; 500 pounds per vessel per day on Saturday and Sunday. Trip limit 1,000 pounds per vessel per day when 80% of quota is reached. The adjusted quota for Spanish mackerel is 3,250,000 pounds. • Discontinued the reversion of the bag limit to 0 when the recreational quota is filled. • Modified the recreational fishing year to the calendar year, • Changed commercial permit requirements to allow qualification in one of three preceding years. • Changed all size limits to fork length only. Minimum size limit is 12 inches FL. 	<p>Amendment 6 (SAFMC 1992) 57 FR 58151</p>	<p>December 9, 1992</p>
<ul style="list-style-type: none"> • Modified requirements for a king or Spanish mackerel permit. • Set the OY target to 40% static SPR for the Atlantic. • Modified the seasonal framework adjustment measures. 	<p>Amendment 8 (SAFMC 1994) 63 FR 10561</p>	<p>March 4, 1998</p>
<ul style="list-style-type: none"> • Allowed the retention and sale of damaged, legal sized king and Spanish mackerel within established trip limits. 	<p>Amendment 9 (SAFMC 1998) 64 FR 16336</p>	<p>March 28, 2000</p>

Description of Action	Amendment	Effective Date
<ul style="list-style-type: none"> Established EFH in the South Atlantic 	Amendment 10 (SAFMC 1998) 65 FR 37292	July 14, 2000
<ul style="list-style-type: none"> Addressed Sustainable Fishery Act definitions. 	Amendment 11 (SAFMC 1999)	December 1999
<ul style="list-style-type: none"> Changed the fishing year for Atlantic group Spanish mackerel to March 1 through February 28/29. 	Amendment 15 SAFMC (2004) 70 FR 39187	July 7, 2005
<ul style="list-style-type: none"> Stock ACL= 5,690,000 pounds. <ul style="list-style-type: none"> Commercial = 3,130,000 pounds and recreational = 2,560,000 pounds Accountability Measures (AMs): Commercial sector to close when commercial ACL will be met; payback when total ACL is exceeded (and overfished). Recreational sector to lower bag limit, if necessary, if total ACL is also exceeded. 	Amendment 18 SAFMC 2011 76 FR 82058	January 20, 2012
<ul style="list-style-type: none"> Established coral HAPCs. 	Amendment 19 in CE-BA1 SAFMC 2009 75 FR 35330	July 22, 2010

Description of Action	Amendment	Effective Date
<ul style="list-style-type: none"> Prohibits king mackerel and Spanish mackerel bag limit sales in Atlantic except state permitted tournaments. Removes income requirements for CMP permits. 	Amendment 20A SAFMC 2013 79 FR 34246	July 16, 2014
<ul style="list-style-type: none"> Recreational fishing measures in SC SMZs. 	Amendment 21 in CE-BA 2 SAFMC 2011 76 FR 82183	January 30, 2012
<ul style="list-style-type: none"> Requires weekly electronic reporting for headboats in South Atlantic. 	Amendment 22 in HB reporting amendment SAFMC 2013 78 FR 78779	January 27, 2014
<ul style="list-style-type: none"> King mackerel and Spanish mackerel dealers must get the universal permit. Federal king mackerel and Spanish mackerel permit holders must sell to federal dealer. Requires weekly electronic reporting for federal dealers. 	Amendment 23 in Generic Dealer Amendment	August 7, 2014

Description of Action	Amendment	Effective Date
	SAFMC 2013 79 FR 19490	
<ul style="list-style-type: none"> • Set Northern (NC/SC line north) and Southern (NC/SC line south) zones and associated commercial quotas. <ul style="list-style-type: none"> • Northern Zone- 622,870 pounds; Southern Zone - 2,507,130 pounds. 	Amendment 20B SAFMC 2014 80 FR 4216	March 1, 2015
<ul style="list-style-type: none"> • For hire reporting requirements. 	Amendment 27 SAFMC 2017	January 4, 2021

SAFMC Regulatory Amendments affecting Atlantic Spanish mackerel:

Description of Action	Amendment	Effective Date
<ul style="list-style-type: none"> Commercial allocation is 2,360,000 pounds and recreational allocation is 740,000 pounds. Bag limits is 4 fish off FL and 10 fish north of FL. 	52 FR 25012	July 2, 1987
<ul style="list-style-type: none"> Final Rule on technical amendment that allows catch of Spanish mackerel under minimum size limit equal to 5% by weight of total catch or Spanish mackerel on board. 	52 FR 36578	September 30, 1987
<ul style="list-style-type: none"> Changed TAC to 4,000,000 pounds with 960,000 pounds allocated to the recreational sector and 3,040,000 pounds allocated to the commercial sector. 	53 FR 25611	July 8, 1988
<ul style="list-style-type: none"> TAC increased to 6,000,000 pounds with 1,440,000 pounds allocated to the recreational sector and 4,600,00 pounds allocated to the commercial sector. 	54 FR 24920	April 1, 1989
<ul style="list-style-type: none"> TAC changed to 5,000,000 pounds with 3,140,000 pounds allocated to the commercial sector and 1,860,000 pounds allocated to the recreational sector. 	55 FR 25986	June 26, 1990
<ul style="list-style-type: none"> TAC increased to 7,000,000 pounds with 3,500,000 pounds allocated to commercial sector and 3,500,000 pounds allocated to recreational sector. Bag limit is 10 fish for areas north of FL and 5 fish for FL. 	56 FR 29920	July 1, 1991
<ul style="list-style-type: none"> Increased bag limit in Florida to that adopted by the state of FL but not to exceed 10 fish. 	57 FR 33924	July 31, 1992

Description of Action	Amendment	Effective Date
<ul style="list-style-type: none"> TAC increased to 9,000,000 with 4,500,000 pounds commercial and 4,500,000 pounds recreational. The initial change in the trip limit occurs when 75% of the quota is met instead of 80%. 	58 FR 40613	July 29, 1993
<ul style="list-style-type: none"> TAC for Atlantic Spanish mackerel is increased to 9,200,000 pounds (4,600,000 pounds commercial and 4,600,000 pounds recreational). 	59 FR 40509	April 1, 1994
<ul style="list-style-type: none"> TAC increased to 9,400,000 pounds (4,700,000 pounds commercial and 4,700,000 pounds recreational). 	60 FR 39698	April 1, 1995
<ul style="list-style-type: none"> Reduced to 7,000,000 (3,500,000 pounds commercial and 3,500,000 pounds recreational). Modify trip regime for commercial vessels off Florida east coast: Nov 1 rather than Dec 1 start for unlimited harvest season and increase the Saturday-Sunday daily trip limit from 500 to 1,500 pounds during that season and increase the daily trip limit from 1,000 to 1,500 pounds for all days of the week during the period that follows the unlimited season and continues until the adjusted quota is taken. 	62 FR 23671	May 1, 1997
<ul style="list-style-type: none"> Increased the TAC to 8,000,000 pounds (4,000,000 pounds commercial and 4,000,000 pounds recreational). 	62 FR 53278	April 1, 1997
<ul style="list-style-type: none"> Decrease the TAC to 6,600,000 pounds and change the allocation from 50/50 to 55% commercial (3,630,000 pounds) and 45% recreational (2,970,000 pounds). 	64 FR 45457	August 20, 1999

Description of Action	Amendment	Effective Date
<ul style="list-style-type: none"> • Increase TAC to 7,040,000 pounds with 3,870,000 pounds commercial and 3,170,000 pounds recreational. • The trip limit from April 1 to November 30 would be 3,500 lb; from December 1 until 75% of the adjusted quota is taken there would be no trip limit on Monday through Friday and on Saturday and Sunday the trip limit would be 1,500 lbs. • The recreational bag limit is increased from 10 to 15 fish per person per day. • MSY = 5.7-7.5 million pounds, Bmsy = 12.2-15.8, MSST = 8.5-11.1, MFMT = 0.38-0.48. 	65 FR 41015	July 3, 2000
<ul style="list-style-type: none"> • Reduce Atlantic Spanish mackerel trip limit to 1,500 lbs per day from March 1, 2004 to March 31, 2004. 	69 FR 9969	March 3, 2004
<ul style="list-style-type: none"> • Reduce trip limit for Atlantic Spanish mackerel to 1,500 lbs from February 1, 2005 to March 31, 2005. 	70 FR 5569	February 3, 2005
<ul style="list-style-type: none"> • Reduce Atlantic Spanish mackerel trip limit to 1,500 lbs from February 5, 2007 to February 28, 2007. 	72 FR 5345	February 6, 2007
<ul style="list-style-type: none"> • Change start date for commercial trip limit of the Atlantic Spanish mackerel in southern zone (off FL) to March 1. 	73FR439	January 3, 2008
<ul style="list-style-type: none"> • Provisions for transfer at sea for gillnets when one set exceeds Spanish mackerel trip limit 	Framework Action SAFMC 2013 79 FR 68802	December 19, 2014

Description of Action	Amendment	Effective Date
<ul style="list-style-type: none"> ACL= 6,063,000 pounds with commercial 3,330,000 pounds and recreational 2,727,000 pounds. 	FW Amendment 1 SAFMC 2014 79 FR 69058	December 22, 2014
<ul style="list-style-type: none"> Trip limits in Southern Zone (SC, GA, FL): 3,500lbs until 75% adjusted quota is met, then 1,500lbs until adjusted quota is met and then 500lbs until the full quota is met. 	FW Amendment 2 SAFMC 2014 80 FR 40936	August 13, 2015
<ul style="list-style-type: none"> Permit restrictions: removes the restriction on fishing for, or retaining, the recreational bag and possession limits of king and Spanish mackerel on a vessel with a Federal commercial permit for king or Spanish mackerel when commercial harvest of king or Spanish mackerel in a zone or region is closed. 	FW Amendment 5 SAFMC 2016 82 FR 35658	August 31, 2017

2.2 Emergency and Interim Rules (if any)

Description of Action	FRN	Effective Date
<ul style="list-style-type: none"> • Divided 3.716 million pounds quota into three areas with 1.869 million pounds going to the Atlantic. <ul style="list-style-type: none"> ○ The Atlantic boundary was bounded by the North Carolina/Virginia state line and a line directly east of the Dade/Monroe County, Florida boundary. • Established a recreational bag limit of 4-fish per trip and allowed sale of recreationally caught Spanish mackerel under the bag limit. • January 1, 1987 to March 31, 1987 	52 FR 290	January 5, 1987
<ul style="list-style-type: none"> • 90-day extension of January 1, 1987 to March 31, 1987 emergency rule for Spanish mackerel. 	52 FR 10762	April 3, 1987

2.3 Secretarial Amendments (if any)

None for Atlantic Spanish mackerel.

2.4 Control Date Notices (if any)

March 7, 2019: participants who enter the commercial sector after March 7, 2019, will not be assured of future access if a management regime that limits participation in the sector is prepared and implemented.

2.5 Management Program Specifications

Table 2.5.1. General Management Information

Species	Spanish mackerel (<i>Scomberomorus maculatus</i>)
Management Unit	Atlantic migratory group Spanish mackerel
Management Unit Definition	All waters from the intersection of New York, Connecticut, and Rhode Island to a line extending due east of the Miami-Dade/Monroe County line
Management Entity	South Atlantic Fishery Management Council (Note: Mid-Atlantic Council participates as voting member on South Atlantic Council’s Mackerel Cobia Committee.)
Management Contacts SERO / Council	SAFMC: Christina Wiegand SERO: Mary Vara/Karla Gore
Current stock exploitation status	Not undergoing overfishing
Current stock biomass status	Not overfished

Table 2.5.2. Management Parameters

Criteria	South Atlantic – Current (SEDAR 28)		
	Definition	Values	Units
M	Average of Lorenzen M (if used)	0.35	Instantaneous natural mortality; per year
F _{CURRENT}	Geometric mean of full fishing mortality rates for 2009-2011 (F ₂₀₀₉₋₂₀₁₁)	0.36	Per year
F _{TARGET}			
Yield at F _{TARGET} (equilibrium)			
F _{MSY}	F _{MSY}	0.69	Per year
B _{MSY}	Biomass at MSY	9548	Metric tons
R ₂₀₁₂			
R _{MSY}			
R _{UNFISHED}			
SSB ₂₀₁₁	Spawning stock biomass in 2011	4862	Metric tons
SSB _{MSY}	Spawning stock biomass at MSY	3266	Metric tons
MSST ¹	MSST = [(1-M) or 0.7 whichever is greater]*B _{MSY}	2127	Metric tons
MFMT	F _{MSY}	0.69	Per year
MSY	Yield at F _{MSY}	2750	Metric tons
OY	Yield at F _{OY}		
F _{OY}	F _{OY} = 65%, 75%, 85% F _{MSY}	65% F _{OY} = 0.449 75% F _{OY} = 0.518 85% F _{OY} = 0.587	
Exploitation Status	F ₂₀₀₉₋₂₀₁₁ / F _{MSY}	0.526	
	F ₂₀₁₁ / F _{MSY}	0.521	
Biomass Status	SSB ₂₀₁₁ /MSST	2.29	
	SSB ₂₀₁₁ / SSB _{MSY}	1.49	
Terminal F (2011)			
Terminal Biomass (2011) ¹			
Generation Time			
T _{REBUILD} (if appropriate)			

Table 2.5.2. Management Parameters Continued				
Criteria	South Atlantic – Proposed (SEDAR 78)			
	Definition	Base Run Values	Units	Median of Base Run MCBs
M	Average of Lorenzen M (if used)			
F _{CURRENT}	Geometric mean of full fishing mortality rates for 2009-2011 (F ₂₀₀₉₋₂₀₁₁)			
F _{TARGET}				
Yield at F _{TARGET} (equilibrium)				
F _{MSY}	F _{MSY}			
B _{MSY} ¹	Biomass at MSY			
R _{MSY}				
SSB				
SSB _{MSY}	Spawning stock biomass at MSY			
MSST ¹	MSST = [(1-M) or 0.7 whichever is greater]*B _{MSY}			
MFMT	F _{MSY}			
MSY	Yield at F _{MSY}			
OY	Yield at F _{OY}			
F _{OY}	F _{OY} = 65%, 75%, 85% F _{MSY}			
Exploitation Status				
Biomass Status ¹				
Terminal F	-			
Terminal Biomass ¹	-			
Generation Time	-			
T _{REBUILD} (if appropriate)	-			

¹Biomass values reported for management parameters and status determinations should be based on the biomass metric recommended through the Assessment process and SSC. This may be total, spawning stock or some measure thereof, and should be applied consistently in this table.

NOTE: “Proposed” columns are for indicating any definitions that may exist in FMPs or amendments that are currently under development and should therefore be evaluated in the current assessment. Please clarify whether landings parameters are ‘landings’ or ‘catch’ (Landings + Discard). If ‘landings’, please indicate how discards are addressed.

Table 2.5.3. Stock Rebuilding Information

None – Atlantic migratory group Spanish mackerel is not currently overfished.

Table 2.5.4. General Projection Specifications

South Atlantic

First Year of Management	2024/2025
Interim basis	ACL, if ACL is met. Average exploitation, if ACL is not met.
Projection Outputs	
Landings	Pounds and numbers
Discards	Pounds and numbers
Exploitation	F & Probability F>MFMT
Biomass (total or SSB, as appropriate)	SSB & Probability SSB>MSST (and Prob. SSB>SSB _{MSY} if under rebuilding plan)
Recruits	Number

Table 2.5.5. Base Run Projections Specifications. Long Term and Equilibrium conditions.

Criteria	Definition	If overfished	If overfishing	Neither overfished nor overfishing
Projection Span	Years	T _{REBUILD}	10	10
Projection Values	F _{CURRENT}	X	X	X
	F _{MSY}	X	X	X
	75% F _{MSY}	X	X	X
	F _{REBUILD}	X		
	F=0	X		

NOTE: Exploitation rates for projections may be based upon point estimates from the base run (current process) or upon the median of such values from the MCBs evaluation of uncertainty. The critical point is that the projections be based on the same criteria as the management specifications.

Table 2.5.6. P-star projections. Short term specifications for OFL and ABC recommendations. Additional P-star projections may be requested by the SSC once the ABC control rule is applied.

Basis	Value	Years to Project	P* applies to
P*	50%	Interim + 5	Probability of overfishing
P*	TBD ¹	Interim + 5	Probability of overfishing
Exploitation	F _{MSY}	Interim + 5	NA
Exploitation	75% of F _{MSY}	Interim + 5	NA

¹ To be determined by the SSC.

Table 2.5.7. Quota Calculation Details

If the stock is managed by quota, please provide the following information.

	Atlantic Spanish Mackerel
Current Acceptable Biological Catch (ABC) and Total Annual Catch Level (ACL) Value for Spanish Mackerel	ACL = ABC = OY ACL = 6,063,000 lbs.
Commercial ACL for Spanish Mackerel	ACL = 3,330,000 lbs.
Recreational ACL for Spanish Mackerel	ACL = 2,727,000 lbs.
Next Scheduled Quota Change	After assessment
Annual or averaged quota?	Annual
If averaged, number of years to average	-
Does the quota include bycatch/discard?	No

How is the quota calculated - conditioned upon exploitation or average landings?

Does the quota include bycatch/discard estimates? If so, what is the source of the bycatch/discard values? What are the bycatch/discard allowances?

The ABC, ACL, and recreational ACT values are based on landed catch only; discards are accounted for in specifying the ABC in terms of landed catch and not total mortality.

Are there additional details of which the analysts should be aware to properly determine quotas for this stock?

No.

2.6 Management and Regulatory Timeline

See attached tables below.

Table 2.5.8 Atlantic Migratory Group Spanish Mackerel Commercial Regulatory History prepared by: Christina Wiegand, SAFMC staff

Year	Quota (lbs ww)	ACL (lbs ww)	Days Open	Fishing Season	Reason for Closure	Season Start Date (first day implemented)	Season end Date (last day effective)	Size Limit	Size Limit Start Date	Size Limit End Date	Retention Limit (# fish)	Retention Limit Start Date	Retention Limit End Date
1983 ¹	27,000,000	NA	365	OPEN	NA	2/4/1983	12/31/1983	12-in FL	2/4/1983	12/31/1983	N/A	2/4/1983	12/31/1983
1984 ²	27,000,000	NA	365	OPEN	NA	1/1/1984	12/31/1984	12-in FL	1/1/1984	12/31/1984	N/A	1/1/1984	12/31/1984
1985 ⁴	27,000,000	NA	365	OPEN	NA	1/1/1985	12/31/1985	12-in FL or 14-in TL	1/1/1985	12/31/1985	N/A	1/1/1985	12/31/1985
1986 ⁴	27,000,000	NA	378	OPEN	NA	1/1/1986	1/14/1987	12-in FL or 14-in TL	1/1/1986	1/14/1987	N/A	1/1/1986	1/14/1987
1987	2,360,000	NA	272	CLOSED	QUOTA MET	4/1/1987	12/29/1987	12-in FL or 14-in TL	4/1/1987	12/29/1987	N/A	4/1/1987	12/29/1987
1988	3,040,000	NA	272	CLOSED	QUOTA MET	4/1/1988	12/29/1988	12-in FL or 14-in TL	4/1/1988	12/29/1988	N/A	4/1/1988	12/29/1988
1989	3,240,000	NA	365	OPEN	NA	4/1/1989	3/31/1990	12-in FL or 14-in TL	4/1/1989	3/31/1990	N/A	4/1/1989	3/31/1990
1990 ³	3,140,000	NA	279	CLOSED	QUOTA MET	4/1/1990	1/25/1991	12-in FL or 14-in TL	4/1/1990	1/25/1991	N/A	4/1/1990	1/25/1991
1991	3,500,000	NA	263	CLOSED	QUOTA MET	4/1/1991	12/20/1991	12-in FL or 14-in TL	4/1/1991	12/20/1991	N/A	4/1/1991	12/20/1991
1992	3,500,000	NA	365	OPEN	NA	4/1/1992	3/31/1993	12-in FL	4/1/1992	3/31/1993	a, b	4/1/1992	3/31/1993
-	-	-	-	-	-	-	-	-	-	-	1,000	1/7/1993	2/19/1993
-	-	-	-	-	-	-	-	-	-	-	500	2/20/1993	3/31/1993
1993	3,500,000	NA	365	OPEN	NA	4/1/1993	3/31/1994	12-in FL	4/1/1993	3/31/1994	a, c	4/1/1993	12/21/1993
-	-	-	-	-	-	-	-	-	-	-	1,000	12/22/1993	2/17/1994
-	-	-	-	-	-	-	-	-	-	-	500	2/18/1994	3/31/1994
1994	4,600,000	NA	365	OPEN	NA	4/1/1994	3/31/1995	12-in FL	4/1/1994	3/31/1995	a,c	4/1/1994	1/28/1995
-	-	-	-	-	-	-	-	-	-	-	1,000	1/29/1995	3/31/1995
1995	4,700,000	NA	365	OPEN	NA	4/1/1995	3/31/1996	12-in FL	4/1/1995	3/31/1996	a, c	4/1/1995	3/31/1996
1996	3,500,000	NA	365	OPEN	NA	4/1/1996	3/31/1997	12-in FL	4/1/1996	3/31/1997	a,c	4/1/1996	3/31/1997
1997	3,500,000	NA	365	OPEN	NA	4/1/1997	3/31/1998	12-in FL	4/1/1997	3/31/1998	a,d	4/1/1997	12/15/1997
-	-	-	-	-	-	-	-	-	-	-	1,500	12/16/1997	3/31/1998
1998	4,000,000	NA	365	OPEN	NA	4/1/1998	3/31/1999	12-in FL	4/1/1998	3/31/1999	a,d	4/1/1998	2/9/1999
-	-	-	-	-	-	-	-	-	-	-	1,500	2/10/1999	3/31/1999
1999	3,630,000	NA	365	OPEN	NA	4/1/1999	3/31/2000	12-in FL	4/1/1999	3/31/2000	a,d	4/1/1999	3/31/2000
2000	3,870,000	NA	365	OPEN	NA	4/1/2000	3/31/2001	12-in FL	4/1/2000	3/31/2001	a, e	4/1/2000	3/31/2001
2001	3,870,000	NA	365	OPEN	NA	4/1/2001	3/31/2002	12-in FL	4/1/2001	3/31/2002	a, e	4/1/2001	3/31/2002
2002	3,870,000	NA	365	OPEN	NA	4/1/2002	3/31/2003	12-in FL	4/1/2002	3/31/2003	a, e	4/1/2002	3/31/2003
2003	3,870,000	NA	365	OPEN	NA	4/1/2003	3/31/2004	12-in FL	4/1/2003	3/31/2004	a, e	4/1/2003	2/28/2004
-	-	-	-	-	-	-	-	-	-	-	1,500	3/1/2004	3/31/2004
2004	3,870,000	NA	365	OPEN	NA	4/1/2004	3/31/2005	12-in FL	4/1/2004	3/31/2005	a, e	4/1/2004	1/31/2005
-	-	-	-	-	-	-	-	-	-	-	1,500	2/1/2005	3/31/2005
2005	3,870,000	NA	365	OPEN	NA	4/1/2005	3/31/2006	12-in FL	4/1/2005	3/31/2006	a, e	4/1/2005	3/31/2006
2006	3,870,000	NA	365	OPEN	NA	3/1/2006	2/28/2007	12-in FL	3/1/2006	2/28/2007	a, e	3/1/2006	2/4/2006
-	-	-	-	-	-	-	-	-	-	-	1,500	2/5/2007	2/28/2007
2007	3,870,000	NA	365	OPEN	NA	3/1/2007	2/29/2008	12-in FL	3/1/2007	2/29/2008	a, e	3/1/2007	2/29/2008
2008	3,870,000	NA	365	OPEN	NA	3/1/2008	2/28/2009	12-in FL	3/1/2008	2/28/2009	a, e	3/1/2008	2/28/2009
2009	3,870,000	NA	365	OPEN	NA	3/1/2009	2/28/2010	12-in FL	3/1/2009	2/28/2010	a, e	3/1/2009	2/28/2010
2010	3,870,000	NA	365	OPEN	NA	3/1/2010	2/28/2011	12-in FL	3/1/2010	2/28/2011	a, e	3/1/2010	2/21/2011
-	-	-	-	-	-	-	-	-	-	-	1,500	2/22/2011	2/28/2011
2011	3,870,000	NA	365	OPEN	NA	3/1/2011	2/29/2012	12-in FL	3/1/2011	2/29/2012	a, e	3/1/2011	1/26/2012
-	-	-	-	-	-	-	-	-	-	-	1,500	1/27/2012	2/29/2012
2012	SEE ACL	3,870,000	365	OPEN	NA	3/1/2012	2/28/2013	12-in FL	3/1/2012	2/28/2013	a, e	3/1/2012	1/5/2013
-	-	-	-	-	-	-	-	-	-	-	1,500	1/6/2013	2/28/2013

Table 2.5.8 Atlantic Migratory Group Spanish Mackerel Commercial Regulatory History prepared by: Christina Wiegand, SAFMC staff

Year	Quota (lbs ww)	ACL (lbs ww)	Days Open	Fishing Season	Reason for Closure	Season Start Date (first day implemented)	Season end Date (last day effective)	Size Limit	Size Limit Start Date	Size Limit End Date	Retention Limit (# fish)	Retention Limit Start Date	Retention Limit End Date
2013	SEE ACL	3,130,000	365	OPEN	NA	3/1/2013	2/28/2014	12-in FL	3/1/2013	2/28/2014	a, e	3/1/2013	1/16/2014
-	-	-	-	-	-	-	-	-	-	-	1,500	1/17/2014	2/28/2014
2014	SEE ACL	3,130,000	365	OPEN	NA	3/1/2014	2/28/2015	12-in FL	3/1/2014	2/28/2015	a, e	3/1/2014	2/19/2015
-	-	-	-	-	-	-	-	-	-	-	1,500	2/20/2015	2/28/2015
2015 ⁵	SEE ACL	3,330,000	365	OPEN	NA	3/1/2015	2/29/2016	12-in FL	3/1/2015	2/29/2016	f, g	3/1/2015	2/29/2016
2016 ⁵	SEE ACL	3,330,000	365	OPEN	NA	3/1/2016	2/28/2017	12-in FL	3/1/2016	2/28/2017	f, g	3/1/2016	2/28/2017
-	-	-	-	-	-	-	-	-	-	-	1,500	2/6/2017	2/28/2017
2017 ⁵	SEE ACL	3,330,000	365	SZ OPEN	NA	3/1/2017	2/28/2018	12-in FL	3/1/2017	2/28/2018	f, g	3/1/2017	1/26/2018
-	-	-	-	-	-	-	-	-	-	-	1,500	1/27/2018	2/28/2018
-	-	-	251	NZ CLOSED	ZONE QUOTA MET	-	11/7/2017	-	-	-	-	-	-
2018 ⁵	SEE ACL	3,330,000	-	NA	NA	3/1/2018	2/28/2019	12-in FL	3/1/2018	2/28/2019	f, g	3/1/2018	12/25/2018
-	-	-	-	-	-	-	-	-	-	-	1,500	12/26/2018	1/26/2019
-	-	-	-	-	-	-	-	-	-	-	500	1/27/2019	2/5/2019
-	-	-	248	NZ CLOSED	ZONE QUOTA MET	-	11/4/2018	-	-	-	-	-	-
-	-	-	341	SZ CLOSED	ZONE QUOTA MET	-	2/5/2019	-	-	-	-	-	-
2019 ⁵	SEE ACL	3,330,000	365	SZ OPEN	NA	3/1/2019	2/29/2020	12-in FL	3/1/2019	2/29/2020	f, g		
-	-	-	-	-	-	-	-	-	-	-	1,500	12/24/2019	
-	-	-	-	-	-	-	-	-	-	-	500	1/29/2020	
-	-	-	156	NZ CLOSED	ZONE QUOTA MET	-	8/24/2019	-	-	-	-	-	-

Notes:

- 1 Spanish mackerel managed as a single stock throughout the Gulf and South Atlantic.
- 2 Spanish mackerel managed as two migratory groups (Atlantic and Gulf migratory) from this point forward.
- 3 Management area extended from TX through NC to TX through NY.
- 4 Stock quota
- 5 Separate Northern (20%) and Southern Zone (80%) quotas.

Trip Limit Codes:

- a Northern Zone (north of Florida/Georgia): 3,500
- b Southern Zone (east Florida): 1,500 pounds per vessel per day from April 1 to November 30. From December 1 until 80% of quota is taken: unlimited harvest on Monday, Wednesday, and Friday; 1,500 pounds per vessel per day on Tuesday and Thursday; 500 pounds per vessel per day on Saturday and Sunday. Trip limit 1,000 pounds per vessel per day when 80% of quota is reached.
- c Southern Zone (east Florida): 1,500 pounds per vessel per day from April 1 to November 30. From December 1 until 80% of quota is taken: unlimited harvest on Monday, Wednesday, and Friday; 1,500 pounds per vessel per day on Tuesday and Thursday; 500 pounds per vessel per day on Saturday and Sunday. Trip limit 1,000 pounds per vessel per day when 75% of quota is reached.
- d Southern Zone (east Florida): 1,500 pounds per vessel per day from April 1 to October 31. From November 1 until 80% of quota is taken: unlimited harvest on Monday, Wednesday, and Friday; 1,500 pounds per vessel per day on Tuesday and Thursday; 1,500 pounds per vessel per day on Saturday and Sunday. Trip limit 1,500 pounds per vessel per day when 75% of quota is reached.
- e Southern Zone (east Florida): April 1 to November 30 would be 3,500 lb; from December 1 until 75% of the adjusted quota is taken there would be no trip limit on Monday through Friday and on Saturday and Sunday the trip limit would be 1,500 lbs.
- f Northern Zone (north of North Carolina/South Carolina): 3,500
- g Southern Zone (SC, GA, east FL): 3,500lbs until 75% adjusted quota is met, then 1,500lbs until adjusted quota is met and then 500lbs until the full quota is met.

Table 2.5.9 Atlantic Migratory Group Spanish Mackerel Recreational Regulatory History prepared by: Christina Wiegand, SAFMC staff

Year	Quota (lbs ww)	ACL (lbs ww)	Days Open	Fishing Season	Reason for Closure	Season Start Date (first day implemented)	Season end Date (last day effective)	Size Limit	Size Limit Start Date	Size Limit End Date	Retention Limit (# fish)	Retention Limit Start Date	Retention Limit End Date
1983 ^{1a}	27,000,000	NA	365	OPEN	NA	2/4/1983	12/31/1983	12-in FL	2/4/1983	12/31/1983	NA	NA	NA
1984 ^{1a}	27,000,000	NA	365	OPEN	NA	1/1/1984	12/31/1984	12-in FL	1/1/1984	12/31/1984	NA	NA	NA
1985 ^{1a}	27,000,000	-	365	OPEN	NA	1/1/1985	12/31/1985	12-in FL or 14-in TL	8/28/1985	12/31/1985	NA	NA	NA
1986 ^{1a}	27,000,000	NA	455	OPEN	NA	1/1/1986	3/31/1987	12-in FL or 14-in TL	1/1/1986	12/31/1986	NA	NA	NA
1987 ²	740,000	NA	365	OPEN	NA	4/1/1987	12/31/1987	12-in FL or 14-in TL	1/1/1987	12/31/1987	GA to NC = 10pp/trip FL = 4pp/trip	7/2/1987	12/31/1987
1988	960,000	NA	276	CLOSED	QUOTA MET	4/1/1988	10/3/1988	12-in FL or 14-in TL	4/1/1988	10/3/1988	GA to NC = 10pp/trip FL = 4pp/trip	4/1/1988	10/3/1988
1989	2,760,000	NA	365	OPEN	NA	4/1/1989	3/31/1990	12-in FL or 14-in TL	4/1/1989	3/31/1990	GA to NC = 10pp/trip FL = 4pp/trip	4/1/1989	3/31/1990
1990 ³	1,860,000	NA	365	OPEN	NA	4/2/1990	3/31/1991	12-in FL or 14-in TL	4/2/1990	3/31/1991	GA to NY = 10pp/trip FL = 4pp/trip	4/2/1990	3/31/1991
1991	3,500,000	NA	365	OPEN	NA	4/3/1991	12/31/1991	12-in FL or 14-in TL	4/3/1991	12/31/1991	GA to NY = 10pp/trip FL = 5pp/trip	7/1/1991	12/31/1991
1992	3,500,000	NA	365	OPEN	NA	1/1/1992	12/31/1992	12-in FL	12/9/1992	12/31/1992	GA to NY = 10pp/trip FL = 10pp/trip	7/31/1992	12/31/1992
1993	3,500,000	NA	365	OPEN	NA	1/1/1993	12/31/1993	12-in FL	1/1/1993	12/31/1993	GA to NY = 10pp/trip FL = 10pp/trip	1/1/1993	12/31/1993
1994	4,600,000	NA	365	OPEN	NA	1/1/1994	12/31/1994	12-in FL	1/1/1994	12/31/1994	GA to NY = 10pp/trip FL = 10pp/trip	1/1/1994	12/31/1994
1995	4,700,000	NA	365	OPEN	NA	1/1/1995	12/31/1995	12-in FL	1/1/1995	12/31/1995	GA to NY = 10pp/trip FL = 10pp/trip	1/1/1995	12/31/1995
1996	3,500,000	NA	365	OPEN	NA	1/1/1996	12/31/1996	12-in FL	1/1/1996	12/31/1996	GA to NY = 10pp/trip FL = 10pp/trip	1/1/1996	12/31/1996
1997	3,500,000	NA	365	OPEN	NA	1/1/1997	12/31/1997	12-in FL	1/1/1997	12/31/1997	GA to NY = 10pp/trip FL = 10pp/trip	1/1/1997	12/31/1997
1998	4,000,000	NA	365	OPEN	NA	1/1/1998	12/31/1998	12-in FL	1/1/1998	12/31/1998	GA to NY = 10pp/trip FL = 10pp/trip	1/1/1998	12/31/1998
1999	2,970,000	NA	365	OPEN	NA	1/1/1999	12/31/1999	12-in FL	1/1/1999	12/31/1999	GA to NY = 10pp/trip FL = 10pp/trip	1/1/1999	12/31/1999
2000	3,170,000	NA	365	OPEN	NA	1/1/2000	12/31/2000	12-in FL	1/1/2000	12/31/2000	15 pp/trip	1/1/2000	12/31/2000
2001	3,170,000	NA	365	OPEN	NA	1/1/2001	12/31/2001	12-in FL	1/1/2001	12/31/2001	15 pp/trip	1/1/2001	12/31/2001
2002	3,170,000	NA	365	OPEN	NA	1/1/2002	12/31/2002	12-in FL	1/1/2002	12/31/2002	15 pp/trip	1/1/2002	12/31/2002
2003	3,170,000	NA	365	OPEN	NA	1/1/2003	12/31/2003	12-in FL	1/1/2003	12/31/2003	15 pp/trip	1/1/2003	12/31/2003
2004	3,170,000	NA	424	OPEN	NA	1/1/2004	2/28/2005	12-in FL	1/1/2004	12/31/2004	15 pp/trip	1/1/2004	12/31/2004
2005	3,170,000	NA	365	OPEN	NA	3/1/2005	2/28/2006	12-in FL	3/1/2005	2/28/2005	15 pp/trip	3/1/2005	2/28/2005
2006	3,170,000	NA	365	OPEN	NA	3/1/2006	2/28/2007	12-in FL	3/1/2006	2/28/2006	15 pp/trip	3/1/2006	2/28/2006
2007	3,170,000	NA	365	OPEN	NA	3/1/2007	2/29/2008	12-in FL	3/1/2007	2/28/2007	15 pp/trip	3/1/2007	2/28/2007
2008	3,170,000	NA	365	OPEN	NA	3/1/2008	2/28/2009	12-in FL	3/1/2008	2/29/2008	15 pp/trip	3/1/2008	2/29/2008
2009	3,170,000	NA	365	OPEN	NA	3/1/2009	2/28/2010	12-in FL	3/1/2009	2/28/2009	15 pp/trip	3/1/2009	2/28/2009
2010	3,170,000	NA	365	OPEN	NA	3/1/2010	2/28/2011	12-in FL	3/1/2010	2/28/2010	15 pp/trip	3/1/2010	2/28/2010

Table 2.5.9 Continued Atlantic Migratory Group Spanish Mackerel Recreational Regulatory History prepared by: Christina Wiegand, SAFMC staff

Year	Quota (lbs ww)	ACL (lbs ww)	Days Open	Fishing Season	Reason for Closure	Season Start Date (first day implemented)	Season end Date (last day effective)	Size Limit	Size Limit Start Date	Size Limit End Date	Retention Limit (# fish)	Retention Limit Start Date	Retention Limit End Date
2011	3,170,000	NA	365	OPEN	NA	3/1/2011	2/29/2012	12-in FL	3/1/2011	2/28/2011	15 pp/trip	3/1/2011	2/28/2011
2012	SEE ACL	2,560,000	365	OPEN	NA	3/1/2012	2/28/2013	12-in FL	3/1/2012	2/29/2012	15 pp/trip	3/1/2012	2/29/2012
2013	SEE ACL	2,560,000	365	OPEN	NA	3/1/2013	2/28/2014	12-in FL	3/1/2013	2/28/2013	15 pp/trip	3/1/2013	2/28/2013
2014	SEE ACL	2,727,000	365	OPEN	NA	3/1/2014	2/28/2015	12-in FL	3/1/2014	2/28/2014	15 pp/trip	3/1/2014	2/28/2014
2015	SEE ACL	2,727,000	365	OPEN	NA	3/1/2015	2/29/2016	12-in FL	3/1/2015	2/28/2015	15 pp/trip	3/1/2015	2/28/2015
2016	SEE ACL	2,727,000	365	OPEN	NA	3/1/2016	2/28/2017	12-in FL	3/1/2016	2/29/2016	15 pp/trip	3/1/2016	2/29/2016
2017	SEE ACL	2,727,000	365	OPEN	NA	3/1/2017	2/28/2018	12-in FL	3/1/2017	2/28/2017	15 pp/trip	3/1/2017	2/28/2017
2018	SEE ACL	2,727,000	365	OPEN	NA	3/1/2018	2/28/2019	12-in FL	3/1/2018	2/28/2018	15 pp/trip	3/1/2018	2/28/2018
2019	SEE ACL	2,727,000	365	OPEN	NA	3/1/2019	2/29/2020	12-in FL	3/1/2019	2/28/2019	15 pp/trip	3/1/2019	2/28/2019

Notes:

- 1 Spanish mackerel managed as a single stock throughout the Gulf and South Atlantic.
- 2 Spanish mackerel managed as two migratory groups (Atlantic and Gulf migratory) from this point forward.
- 3 Management area extended from TX through NC to TX through NY.
- a Stock quota

2.7 State Regulatory History

Provided by the Atlantic States Marine Fisheries Commission

Table 2.2a. State Regulatory History – North Carolina and South Carolina as provided by the state management agencies.

Description of Action	State	Effective Date
1500 pounds max per day, land and sell aggregate king and Spanish mackerel combined	NC	08/04/80
2000 pounds max per day, land and sell aggregate king and Spanish mackerel combined	NC	10/01/81
3500 pounds max per day, land and sell aggregate king and Spanish mackerel combined	NC	10/01/82
Proclamation authority established to specify areas, seasons, quantity, means/methods, size limits	NC	12/01/87
Creel limit: 10 fish/person/fishing trip by hook and line	NC	6/15/88
Creel limit: 10 fish/person/fishing trip by hook and line unless person is in possession of Federal Permit to fish on Spanish mackerel quota. Charter boats with federal Coastal migratory Charter Permit shall not exceed 10 fish per person with more than 3 person on board including captain and mate.	NC	6/22/88
All coastal waters closed to harvest and retention of king and Spanish mackerel taken by any method. Proclamation expires 3/31/89	NC	3/7/89
Creel limit: 10 fish/person/dishing trip by hook and line unless person is in possession of Federal Permit to fish on Spanish mackerel quota. Charter boats with federal Coastal migratory Charter Permit shall not exceed 10 fish per person with more than 3 person on board including captain and mate. Creel limits do not apply to commercial fishermen using nets. Proclamation expires 3/31/90	NC	5/9/89
Creel limit: 10 fish/person/dishing trip by hook and line unless person is in possession of Federal Permit to fish on Spanish mackerel quota. Charter boats with federal Coastal migratory Charter Permit shall not exceed 10 fish per person with more than 3 person on board including captain and mate. Creel limits do not apply to commercial fishermen using nets.	NC	4/1/90
It is unlawful to have a purse gill net on board a vessel when taking or landing Spanish or King Mackerel.	NC	1/1/91
Commercial season closes, reopens 4/1/92	NC	1/5/92

Table 2.2a. State Regulatory History – North Carolina and South Carolina as provided by the state management agencies. Continued		
12 inch FL minimum size.	NC	2/15/94
Creel limit: 10 fish/person/dishing trip by hook and line unless person is in possession of Federal Permit to fish on Spanish mackerel quota. Charter boats with federal Coastal migratory Charter Permit shall not exceed 10 fish per person with more than 3 person on board including captain and mate. Creel limits do not apply to commercial fishermen using nets except as specified by NCAC 3M/.0301.	NC	2/15/94
Proclamation authority for hook and line deleted. Entered into rule: Creel limit: 10 fish/person/dishing trip by hook and line unless person is in possession of Federal Permit to fish on Spanish mackerel quota. Charter boats with federal Coastal migratory Charter Permit shall not exceed 10 fish per person with more than 3 person on board including captain and mate	NC	3/1/96
<p>Temporary rule change: Recreational purpose wording added and commercial gear working changed to commercial fishing operation.</p> <p>12 inch minimum size</p> <p>Creel limit: 10 fish per person per day if taken by hook & line or for recreational purpose</p> <p>Holders of valid federal permits may exceed creel limit. Charterboats with valid federal permits shall not exceed 10 fish per person while fishing with more than 3 persons on board including captain and mate.</p>	NC	7/1/99
It is unlawful to possess more than 15 Spanish mackerel per person per day taken for recreational purposes. It is unlawful to possess more than 15 Spanish mackerel per person per day in the Atlantic Ocean beyond three miles in a commercial fishing operation except for persons holding a valid National Marine Fisheries Service Spanish Mackerel Commercial Vessel Permit.	NC	4/1/01
Full consistency with federal regulations	SC	06/88-2007

Table 2.2b. State Regulatory History - North Carolina through Florida for Spanish mackerel as of 1990 as recorded in the Fishery Management Plan for Spanish Mackerel, Fishery Management Report No. 18, Atlantic States Marine Fisheries Commission, November 1990.

State	Bag Limit	Size Limit	Other
NC	10 fish	none	3,500 lb commercial trip limit
SC	10 fish	12" FL min.	Season closes with EEZ closure
GA	10 fish	12" FL min.	Recreational season open 3/16-11/30; 5% size tolerance by weight on trawlers
FL	5 fish	12" FL min.	1,850,000 lb quota for power assisted gill nets; season: Dec 15-Oct31. 205,000lb quota for all other forms of commercial fishing gears; season: Nov 1-Oct 31. 3 1/2 inch minimum stretched mesh.

Table 2.2c. State Regulatory History - New York through Florida, for Spanish Mackerel at specific times as taken from annual ASMFC FMP Reviews for Spanish Mackerel.

As of December 1995

State	Bag Limit	Size Limit	Other
NJ	10 fish	14" TL min.	
DE	10 fish	14" TL min.	
MD	10 fish	14" TL min.	Declaration allowing regulation through framework. Gill net mesh sizes for Chesapeake Bay.
VA	10 fish	14" TL min.	Size limit exemption for pound net fishery; closure when quota reached; 3500 lb trip limit.
NC	10 fish	12" FL min.	3,500 lb commercial trip limit (Spanish and king mackerel combined); finfish excluder devices required in shrimp trawls. Purse gill net prohibition.
SC	10 fish	12" FL min.	3,500 lb commercial trip limit tracking by reference the federal FMP.
GA	10 fish	12" FL min.	Season closed December 1 - March 15.
FL	10 fish	12" FL min.	3 1/2 inch minimum mesh size, 600 yd. maximum length net. Commercial daily trip limits: 1,500 lb April 1 - November 30; December 1 until 75% of adjusted quota reached-unlimited harvest on Monday, Wednesday, and Friday; 1,500 lb per vessel per day on Tuesday and Thursday; 500 lb per vessel per day on Saturday and Sunday; >75% adjusted quota until quota fulfilled-1,000 lb per vessel per day; >100% of adjusted quota-500 lb per vessel per day.

As of September 1998

State	Bag Limit	Size Limit	Other
NY	10 fish	14" TL min.	3,500 lb. commercial trip limit
NJ	10 fish	14" TL min	
DE	10 fish	14" TL min	
MD	10 fish	14" TL min	Declaration allowing regulation through framework. Gill net mesh sizes for Chesapeake Bay
VA	10 fish	14" TL min	Size limit exemption for pound net fishery; closure when quota reached; 3,500 lb. trip limit
NC	10 fish	12" FL min	3,500 lb. commercial trip limit (Spanish and king mackerel combined); finfish excluder devices required in shrimp trawls. Purse gill net prohibition.
SC	10 fish	12" FL min	3,500 lb. commercial trip limit tracking by reference the federal FMP.
GA	10 fish	12" FL min	Season closed December 1 - March 15.
FL	10 fish	12" FL min	3½ " minimum mesh size, 600 yd. maximum length net. Commercial daily trip limits: 1,500 lb. April 1 - November 30; December 1 until 75% of adjusted quota reached - unlimited harvest on Monday, Wednesday and Friday; 1,500 lb. per vessel per day on Tuesday and Thursday; 500 lb. per vessel on Saturday and Sunday; >75% adjusted quota until quota filled - 1,500 lb. per vessel per day; > 100%of adjusted quota - 500 lb. per vessel per day.

As of October 2001

State	Recreational	Commercial	Notes
NY	14"; 15 fish	14"	3,500 lb. commercial possession limit/vessel
NJ	14"; 10 fish	14" TL	
DE	14" TL; 10 fish	no fishery	
MD	14"; 15 fish	14"	Declaration allowing regulation through framework; gill net mesh sizes for Chesapeake Bay
PRFC	14"; 15 fish	14"	
VA	14" TL; 15 fish	14" TL	Size limit exemption for pound net fishery; closure when quota reached; 3,500 lb. trip limit
NC	12" FL; 15 fish	12" FL	3,500 lb. commercial trip limit (Spanish and king mackerel combined); finfish excluder devices required in shrimp trawls. Purse gill net prohibition.
SC	12" FL; 15 fish	12" FL	Federal commercial harvest restrictions apply; federal permit required to exceed bag limit; state license required to land/sell.
GA	12" FL; 15 fish	12" FL	Commercial landings from state waters limited to bag limits; gillnets/longline gear prohibited in state waters; state waters closed December 1 - March 15 for harvest of Spanish mackerel; commercial landings (3,500 lb. trip limit) from EEZ by federally permitted vessels allowed throughout year as long as the federal quota remains open.
FL	12" FL; 15 fish	12" FL	3½ " minimum mesh size, 600 yd. maximum length net; Commercial daily trip limits: 1,500 lb. April 1 - November 30; December 1 until 75% of adjusted quota reached - unlimited harvest Mon-Fri, 1,500 lb. per vessel/day Sat- Sun; >75% adjusted quota until quota filled - 1,500 lb. per vessel/day; > 100% of adjusted quota - 500 lb. per vessel/day.

As of October 2002

State	Recreational	Commercial	Notes
NY	14"; 15 fish	14"	3,500 lb. commercial possession limit/vessel
NJ	14"; 10 fish	14" TL	
DE	14" TL; 10 fish	no fishery	
MD	14"; 15 fish	14"	Declaration allowing regulation through framework; gill net mesh sizes for Chesapeake Bay
PRFC	14"; 15 fish	14"	
VA	14" TL; 15 fish	14" TL	Size limit exemption for pound net fishery; closure when quota reached; 3,500 lb. trip limit
NC	12" FL; 15 fish	12" FL	3,500 lb. commercial trip limit (Spanish and king mackerel combined); finfish excluder devices required in shrimp trawls. Purse gill net prohibition.
SC	12" FL; 15 fish	12" FL	Federal commercial harvest restrictions apply; federal permit required to exceed bag limit; state license required to land/sell.
GA	12" FL; 15 fish	12" FL	Commercial landings from state waters limited to bag limits; gillnets/longline gear prohibited in state waters; state waters closed December 1 - March 15 for harvest of Spanish mackerel; commercial landings (3,500 lb. trip limit) from EEZ by federally permitted vessels allowed throughout year as long as the federal quota remains open.
FL	12" FL; 15 fish	12" FL	3½ " minimum mesh size, 600 yd. maximum length net; Commercial daily trip limits: 1,500 lb. April 1 - November 30; December 1 until 75% of adjusted quota reached - unlimited harvest Mon-Fri, 1,500 lb. per vessel/day Sat- Sun; >75% adjusted quota until quota filled - 1,500 lb. per vessel/day; > 100% of adjusted quota - 500 lb. per vessel/day.

As of October 2004

State	Recreational	Commercial	Notes
NY	14"; 15 fish	14"	3,500 lb. commercial possession limit/vessel
NJ	14"; 10 fish	14" TL	
DE	14" TL; 10 fish	no fishery	
MD	14"; 15 fish	14"	Declaration allowing regulation through framework; gill net mesh sizes for Chesapeake Bay
PRFC	14"; 15 fish	14"	
VA	14" TL; 15 fish	14" TL	Size limit exemption for pound net fishery; closure when quota reached; 3,500 lb. trip limit
NC	12" FL; 15 fish	12" FL	3,500 lb. commercial trip limit (Spanish and king mackerel combined); finfish excluder devices required in shrimp trawls. Purse gill net prohibition.
SC	12" FL; 15 fish	12" FL	Federal commercial harvest restrictions apply; federal permit required to exceed bag limit; state license required to land/sell.
GA	12" FL; 15 fish	12" FL	Commercial landings from state waters limited to bag limits; gillnets/longline gear prohibited in state waters; state waters closed December 1 - March 15 for harvest of Spanish mackerel; commercial landings (3,500 lb. trip limit) from EEZ by federally permitted vessels allowed throughout year as long as the federal quota remains open.
FL	12" FL; 15 fish	12" FL	3½ " minimum mesh size, 600 yd. maximum length net; Commercial daily trip limits: 1,500 lb. April 1 - November 30; December 1 until 75% of adjusted quota reached - unlimited harvest Mon-Fri, 1,500 lb. per vessel/day Sat- Sun; >75% adjusted quota until quota filled - 1,500 lb. per vessel/day; > 100% of adjusted quota - 500 lb. per vessel/day.

As of October 2005

State	Recreational	Commercial	Notes
NY	14" TL; 15 fish	14" TL	3,500 lb. commercial possession limit/vessel
NJ	14" TL; 10 fish	14" TL	
DE	14" TL; 10 fish	14" TL	Gill net and drift net restrictions
MD	14" TL; 15 fish	14" TL	Declaration allowing regulation through framework; gill net mesh sizes for Chesapeake Bay
PRFC	14" TL; 15 fish	14" TL	Closure when quota reached
VA	14" TL; 15 fish	14" TL	Size limit exemption for pound net fishery; closure when quota reached; 3,500 lb. trip limit
NC	12" FL; 15 fish	12" FL	3,500 lb. commercial trip limit (Spanish and king mackerel combined); finfish excluder devices required in shrimp trawls. Purse gill net prohibition.
SC	12" FL; 15 fish	12" FL	Federal commercial harvest restrictions apply; federal permit required to exceed bag limit; state license required to land/sell.
GA	12" FL; 15 fish	12" FL	Commercial landings from state waters limited to bag limits; gillnets/longline gear prohibited in state waters; state waters closed December 1 - March 15 for harvest of Spanish mackerel; commercial landings (3,500 lb. trip limit) from EEZ by federally permitted vessels allowed throughout year as long as the federal quota remains open.
FL	12" FL; 15 fish Transfer at sea prohibited.	12" FL	3½ " minimum mesh size, 600 yd. maximum length net. Commercial daily trip limits: 3,500 lb. April 1 - November 30; December 1 until 75% of adjusted quota reached - 3,500 lb. per vessel/day Mon-Fri, 1,500 lb. per vessel/day Sat-Sun; >75% adjusted quota until quota filled - 1,500 lb. per vessel/day; > 100% of adjusted quota - 500 lb. per vessel/day.

All information included in the following tables are pulled from annual state FMP compliance reports (NY-FL), and reported in annual ASMFC FMP Reviews for Spanish Mackerel.

As of 2006

Notes: commercial license required to sell Spanish mackerel in all states; other general gear restrictions apply to the harvest of Spanish mackerel.

State	Recreational	Commercial
NY	14" TL, 15 fish	14" TL. 3,500 lb. trip limit
NJ	14" TL, 10 fish	14" TL.
DE	14" TL, 10 fish	14" TL.
MD	14" TL, 15 fish	14" TL.
PRFC	14" TL, 15 fish	14" TL. Closure when quota reached.
VA	14" TL, 15 fish	14" TL; size limit exemption for pound net fishery. 3,500 lb. trip limit. Closure when quota reached.
NC	12" FL, 15 fish	12" FL. 3,500 lb. trip limit (Spanish and king mackerel combined). Purse gill nets prohibited.
SC	12" FL, 15 fish	12" FL, 15 fish
GA	12" FL, 15 fish	12" FL. State waters: 15 fish limit, closure from December 1 - March 15. 3,500 trip limit in federal waters. Closure when quota reached.
FL	12" FL, 15 fish	12" FL. Trip limits: April 1 – Nov. 30 - 3,500 lb.; Dec. 1 until 75% of adjusted quota reached - 3,500 lb. Mon-Fri. & 1,500 lb. Sat-Sun; >75% adjusted quota until quota filled -1,500 lb.; > 100% of adjusted quota - 500 lb.

As of 2007

Note: commercial license required to sell Spanish mackerel in all states; other general gear restrictions effect the harvest of Spanish mackerel		
State	Recreational	Commercial
NY	14" TL, 15 fish	14" TL. 3,500 lb trip limit
NJ	14" TL, 10 fish	14" TL.
DE	14" TL, 10 fish	14" TL.
MD	14" TL, 15 fish	14" TL.
PRFC	14" TL, 15 fish	14" TL. Closure if/when federal waters close.
VA	14" TL, 15 fish	14" TL. 3,500 lb trip limit. Closure if/when federal waters close.
NC	12" FL, 15 fish	12" FL. 3,500 lb trip limit (Spanish and king mackerel combined). Purse gill nets prohibited.
SC	12" FL, 15 fish	12" FL. 15 fish. Closure if/when federal waters close.
GA	12" FL, 15 fish	12" FL. 15 fish. Closure from December 1 - March 15.
FL	12" FL, 15 fish. Transfer to other vessels at sea is prohibited.	12" FL. Trip limits: April 1 – Nov. 30 - 3,500 lb; Dec. 1 until 75% of adjusted quota reached - unlimited Mon-Fri. & 1,500 lb Sat-Sun; >75% adjusted quota until quota filled -1,500 lb; > 100% of adjusted quota - 500 lb.

As of 2008

<p>Note: commercial license required to sell Spanish mackerel in all states; other general gear restrictions effect the harvest of Spanish mackerel</p>		
State	Recreational	Commercial
NY	14" TL, 15 fish	14" TL. 3,500 lb trip limit
NJ	14" TL, 10 fish	14" TL.
DE	14" TL, 10 fish	14" TL.
MD	14" TL, 15 fish	14" TL.
PRFC	14" TL, 15 fish	14" TL. Closure if/when federal waters close.
VA	14" TL, 15 fish	14" TL. 3,500 lb trip limit. Closure if/when federal waters close.
NC	12" FL, 15 fish	12" FL. 3,500 lb trip limit (Spanish and king mackerel combined). Purse gill nets prohibited.
SC	12" FL, 15 fish	12" FL. 15 fish. Closure if/when federal waters close.
GA	12" FL, 15 fish	12" FL. 15 fish. Closure from December 1 - March 15.
FL	12" FL, 15 fish. Transfer to other vessels at sea is prohibited.	12" FL. Trip limits: April 1 to Nov. 30 - 3500 lb; Dec. 1 until 75% of adjusted quota reached - 3500 lb Mon-Fri. & 1500 lb Sat-Sun; >75% adjusted quota until quota filled -1500 lb; > 100% of adjusted quota - 500 lb.

As of 2009

Note: commercial license required to sell Spanish mackerel in all states; other general gear restrictions effect the harvest of Spanish mackerel		
State	Recreational	Commercial
NY	14" TL, 15 fish	14" TL. 3,500 lb trip limit
NJ	14" TL, 10 fish	14" TL.
DE	14" TL, 10 fish	14" TL.
MD	14" TL, 15 fish	14" TL.
PRFC	14" TL, 15 fish	14" TL. Closure if/when federal waters close.
VA	14" TL, 15 fish	14" TL. 3,500 lb trip limit. Closure if/when federal waters close.
NC	12" FL, 15 fish	12" FL. 3,500 lb trip limit (Spanish and king mackerel combined). Purse gill nets prohibited.
SC	12" FL, 15 fish	12" FL. 15 fish. Closure if/when federal waters close.
GA	12" FL, 15 fish	12" FL. 15 fish. Closure from December 1 - March 15.
FL	12" FL, 15 fish. Transfer to other vessels at sea is prohibited.	12" FL. Trip limits: April 1 until Nov. 30 - 3500 lb; Dec. 1 until 75% of adjusted quota reached – 3500 lb Mon-Fri. & 1500 lb Sat-Sun; >75% adjusted quota until quota filled -1500 lb; > 100% of adjusted quota - 500 lb.
	Cast nets less than 14' and beach or haul seines with no greater than 2" stretched mesh allowed	Restricted Species Endorsement Required
		Transfer of fish between vessels prohibited
		Allowed gear: beach or haul seine, cast net, hook and line, or spearing

During the years 2010 and 2011 no FMP reviews were produced. All management changes were captured in the subsequent 2012 report

As of 2010

Note: commercial license required to sell Spanish mackerel in all states; other general gear restrictions effect the harvest of Spanish mackerel		
State	Recreational	Commercial
NY	14" TL, 15 fish	14" TL. 3,500 lb trip limit
NJ	14" TL, 10 fish	14" TL.
DE	14" TL, 10 fish	14" TL.
MD	14" TL, 15 fish	14" TL.
PRFC	14" TL, 15 fish	14" TL. Closure if/when federal waters close.
VA	14" TL, 15 fish	14" TL. 3,500 lb trip limit. Closure if/when federal waters close.
NC	12" FL, 15 fish	12" FL. 3,500 lb trip limit (Spanish and king mackerel combined). Purse gill nets prohibited.
SC	12" FL, 15 fish	12" FL. 15 fish. Closure if/when federal waters close.
GA	12" FL, 15 fish	12" FL. 15 fish. Closure from December 1 - March 15.
FL	12" FL, 15 fish. Transfer to other vessels at sea is prohibited.	12" FL. Trip limits: April 1 to Nov. 30 - 3500 lb; Dec. 1 until 75% of adjusted quota reached - 3500 lb Mon-Fri. & 1500 lb Sat-Sun; >75% adjusted quota until quota filled -1500 lb; > 100% of adjusted quota - 500 lb.

As of 2011

Note: commercial license required to sell Spanish mackerel in all states; other general gear restrictions effect the harvest of Spanish mackerel		
State	Recreational	Commercial
NY	14" TL, 15 fish	14" TL. 3,500 lb trip limit
NJ	14" TL, 10 fish	14" TL.
DE	14" TL, 10 fish	14" TL.
MD	14" TL, 15 fish	14" TL.
PRFC	14" TL, 15 fish	14" TL. Closure if/when federal waters close.
VA	14" TL, 15 fish	14" TL. 3,500 lb trip limit. Closure if/when federal waters close.
NC	12" FL, 15 fish	12" FL. 3,500 lb trip limit (Spanish and king mackerel combined). Purse gill nets prohibited.
SC	12" FL, 15 fish	12" FL. 15 fish. Closure if/when federal waters close.
GA	12" FL, 15 fish	12" FL. 15 fish. Closure from December 1 - March 15.
FL	12" FL, 15 fish. Transfer to other vessels at sea is prohibited.	12" FL. Trip limits: April 1 to Nov. 30 - 3500 lb; Dec. 1 until 75% of adjusted quota reached - 3500 lb Mon-Fri. & 1500 lb Sat-Sun; >75% adjusted quota until quota filled -1500 lb; > 100% of adjusted quota - 500 lb.

As of 2012

Note: commercial license required to sell Spanish mackerel in all states; other general gear restrictions effect the harvest of Spanish mackerel		
State	Recreational	Commercial
NY	14" TL, 15 fish	14" TL. 3,500 lb trip limit
NJ	14" TL, 10 fish	14" TL.
DE	14" TL, 15 fish	14" TL.
MD	14" TL, 15 fish	14" TL.
PRFC	14" TL, 15 fish	14" TL. Closure if/when federal waters close.
VA	14" TL, 15 fish	14" TL. 3,500 lb trip limit. Closure if/when federal waters close.
NC	12" FL, 15 fish	12" FL. 3,500 lb trip limit (Spanish and king mackerel combined). Purse gill nets prohibited.
SC	12" FL, 15 fish	12" FL. 15 fish. Closure if/when federal waters close.
GA	12" FL, 15 fish	12" FL. 15 fish. Closure from December 1 - March 15.
FL	12" FL, 15 fish. Transfer to other vessels at sea is prohibited. Cast nets less than 14' and beach or haul seines with no greater than 2" stretched mesh allowed	12" FL. Trip limits: April 1 to Nov. 30 - 3500 lb; Dec. 1 until 75% of adjusted quota reached - 3500 lb Mon-Fri. & 1500 lb Sat-Sun; >75% adjusted quota until quota filled -1500 lb; > 100% of adjusted quota - 500 lb. Restricted species endorsement required. Transfer between vessels prohibited. Allowed gear: beach or haul seine, cast net, hook and line, or spearing.

As of 2013

Note: commercial license required to sell Spanish mackerel in all states; other general gear restrictions effect the harvest of Spanish mackerel		
State	Recreational	Commercial
NY	14" TL, 15 fish	14" TL. 3,500 lb trip limit
NJ	14" TL, 10 fish	14" TL.
DE	14" TL, 10 fish	14" TL.
MD	14" TL, 15 fish	14" TL. 3,500 lb trip limit
PRFC	14" TL, 15 fish	14" TL. Closure if/when federal waters close.
VA	14" TL, 15 fish	14" TL. 3,500 lb trip limit. Closure if/when federal waters close.
NC	12" FL, 15 fish	12" FL. 3,500 lb trip limit (Spanish and king mackerel combined). Purse gill nets prohibited. 11½" FL for pound net fishery during August and September.
SC	12" FL, 15 fish	12" FL. 15 fish. Closure if/when federal waters close.
GA	12" FL, 15 fish	12" FL. 15 fish. Closure from December 1 - March 15.
FL	12" FL, 15 fish. Transfer to other vessels at sea is prohibited.	12" FL. Trip limits: April 1 until Nov. 30 - 3500 lb; Dec. 1 until 75% of adjusted quota reached – 3500 lb Mon-Fri. & 1500 lb Sat-Sun; >75% adjusted quota until quota filled - 1500 lb; > 100% of adjusted quota - 500 lb.
	Cast nets less than 14' and beach or haul seines with no greater than 2" stretched mesh allowed	Restricted Species Endorsement Required
		Transfer of fish between vessels prohibited
		Allowed gear: beach or haul seine, cast net, hook and line, or spearing

As of 2014

Note: commercial license required to sell Spanish mackerel in all states; other general gear restrictions effect the harvest of Spanish mackerel			
State	Recreational	Commercial	Regulation Changes
NY	14" TL, 15 fish	14" TL. 3,500 lb trip limit	
NJ	14" TL, 10 fish	14" TL.	
DE	14" TL, 15 fish	14" TL. 3,500 lb trip limit	
MD	14" TL, 15 fish	14" TL. 3,500 lb trip limit	
PRFC	14" TL, 15 fish	14" TL. Closure if/when federal waters close.	
VA	14" TL, 15 fish	14" TL. 3,500 lb trip limit. Closure if/when federal waters close.	
NC	12" FL, 15 fish	12" FL. 3,500 lb trip limit (Spanish and king mackerel combined). Purse gill nets prohibited. 11½" FL for pound net fishery July 3-Sept 30.	
SC	12" FL, 15 fish	12" FL. 15 fish. Closure if/when federal waters close.	
GA	12" FL, 15 fish	12" FL. 15 fish.	As of January 1, 2014, Spanish Mackerel no longer have a fishing season. Size and bag limits will stay the same.
FL	12" FL, 15 fish. Transfer to other vessels at sea is prohibited.	12" FL. Trip limits: April 1 until Nov. 30 - 3500 lb; Dec. 1 until 75% of adjusted quota reached – 3500 lb Mon-Fri. & 1500 lb Sat-Sun; >75% adjusted quota until quota filled -1500 lb; > 100% of adjusted quota - 500 lb.	Effective October 12, 2015:
	Cast nets less than 14' and beach or haul seines with no greater than 2" stretched mesh allowed	Restricted Species Endorsement Required	68B-23.006 Other Prohibitions.
		Transfer of fish between vessels prohibited	(1) It is unlawful for any person to possess, transport, buy, sell, exchange or attempt to buy, sell or exchange any Spanish Mackerel harvested in violation of this chapter.
		Allowed gear: beach or haul seine, cast net, hook and line, or spearing	(2) The Commission shall issue a permit pursuant to Rule 68B-2.010, F.A.C., to authorize Spanish Mackerel caught in an organized tournament to be donated to a licensed wholesale dealer.
			(3) The prohibitions of this chapter apply as well to any and all persons operating a vessel in state waters, who shall be deemed to have violated any prohibition which has been violated by another person aboard such vessel.

As of 2015

Note: commercial license required to sell Spanish mackerel in all states; other general gear restrictions effect the harvest of Spanish mackerel			
State	Recreational	Commercial	Regulation Changes
NY	14" TL, 15 fish	14" TL. 3,500 lb trip limit.	<p><i>North Carolina</i></p> <p>One proclamation was issued under rule 15A NCAC 03M .0512 to remain in compliance with the Atlantic States Marine Fishery Commission. Addendum I to the Omnibus Amendment establishes a pilot program that would allow states to reduce the Spanish mackerel minimum size limit for the commercial pound net fishery to 11 ½ inches during the summer months of July through September. The measure is intended to reduce waste of these shorter fish, which are discarded dead in the summer months, by converting them to landed fish that will be counted against the quota. The Division issued a proclamation suspending the 12-inch fork length size limit and adopting the 11 ½ inch fork length size limit in the commercial pound net fishery from July 4, 2016 to September 30, 2016.</p>
NJ	14" TL, 10 fish	14" TL. 3,500 lb trip limit.	
DE	14" TL, 15 fish	14" TL. 3,500 lb trip limit.	
MD	14" TL, 15 fish	14" TL. 3,500 lb trip limit. March-Feb.	
PRFC	14" TL, 15 fish	14" TL. Closure if/when MD and VA fisheries close.	
VA	14" TL, 15 fish	14" TL. 3,500 lb trip limit. Closure if/when federal waters close.	
NC	12" FL, 15 fish	12" FL; 11.5" FL in pound net fishery July 4 th – Sept 30 th , 2016. 3,500 lb trip limit for combined Spanish and king mackerel landings.	
SC	12" FL, 15 fish	12" FL. 15 fish. 3,500 lb trip limit. March-Feb. Closure if/when federal waters close.	
GA	12" FL, 15 fish	12" FL. 3,500 lb trip limit.	
FL	12" FL or 14" TL, 15 fish. Cast nets less than 14' and beach or haul seines within 2" stretched mesh allowed	12" FL or 14" TL. Trip limits: April 1 until Nov. 30 - 3500 lb; Dec. 1 until 75% of adjusted quota reached – 3500 lb Mon-Fri. & 1500 lb Sat-Sun; >75% adjusted quota until quota filled -1500 lb; > 100% of adjusted quota - 500 lb.	
		Restricted Species Endorsement Required	
		Allowed gear: beach or haul seine, cast net, hook and line, or spearing.	

As of 2016

Note: commercial license required to sell Spanish mackerel in all states; other general gear restrictions effect the harvest of Spanish mackerel

State	Recreational	Commercial	Regulation Changes
NY	14" TL, 15 fish	14" TL. 3,500 lb trip limit.	No state regulatory changes were reported for 2016. In 2017, Framework Amendment 5 to the Fishery Management Plan for Coastal Migratory Pelagics in the Gulf of Mexico and Atlantic Regions was approved by the SAFMC and GMFMC. This Framework Amendment allows commercially permitted vessels to operate as private recreational vessels when the commercial season is closed for Spanish or king mackerel.
NJ	14" TL, 10 fish	14" TL. 3,500 lb trip limit.	
DE	14" TL, 15 fish	14" TL. 3,500 lb trip limit.	
MD	14" TL, 15 fish	14" TL. 3,500 lb trip limit. March-Feb.	
PRFC	14" TL, 15 fish	14" TL. Closure if/when MD and VA fisheries close.	
VA	14" TL, 15 fish	14" TL. 3,500 lb trip limit. Closure if/when federal waters close.	
NC	12" FL, 15 fish	12" FL; 11.5" FL in pound net fishery July 4 th – Sept 30 th , 2016. 3,500 lb trip limit for combined Spanish and king mackerel landings.	
SC	12" FL, 15 fish	12" FL. 15 fish. 3,500 lb trip limit. March-Feb. Closure if/when federal waters close.	
GA	12" FL, 15 fish	12" FL. 3,500 lb trip limit.	
FL	12" FL or 14" TL, 15 fish. Cast nets less than 14' and beach or haul seines within 2" stretched mesh allowed	12" FL or 14" TL. Trip limits: April 1 until Nov. 30 - 3500 lb; Dec. 1 until 75% of adjusted quota reached – 3500 lb Mon-Fri. & 1500 lb Sat-Sun; >75% adjusted quota until quota filled - 1500 lb; > 100% of adjusted quota - 500 lb.	
		Restricted Species Endorsement Required	
		Allowed gear: beach or haul seine, cast net, hook and line, or spearing.	

As of 2017

Note: commercial license required to sell Spanish mackerel in all states; other general gear restrictions effect the harvest of Spanish mackerel			
State	Recreational	Commercial	Regulation Changes
NY	14" TL, 15 fish	14" TL. 3,500 lb trip limit.	No state regulatory changes were reported for 2017. In 2017, Framework Amendment 5 to the Fishery Management Plan for Coastal Migratory Pelagics in the Gulf of Mexico and Atlantic Regions was approved by the SAFMC and GMFMC. This Framework Amendment allows commercially permitted vessels to operate as private recreational vessels when the commercial season is closed for Spanish or king mackerel.
NJ	14" TL, 10 fish	14" TL. 3,500 lb trip limit.	
DE	14" TL, 15 fish	14" TL. 3,500 lb trip limit.	
MD	14" TL, 15 fish	14" TL. 3,500 lb trip limit. March-Feb.	
PRFC	14" TL, 15 fish	14" TL. Closure if/when MD and VA fisheries close.	
VA	14" TL, 15 fish	14" TL. 3,500 lb trip limit. Closure if/when federal waters close.	
NC	12" FL, 15 fish	12" FL; 11.5" FL in pound net fishery July 4 th – Sept 30 th , 2016. 3,500 lb trip limit for combined Spanish and king mackerel landings.	
SC	12" FL, 15 fish	12" FL. 15 fish. 3,500 lb trip limit. March-Feb. Closure if/when federal waters close.	
GA	12" FL, 15 fish	12" FL. 3,500 lb trip limit.	
FL	12" FL or 14" TL, 15 fish. Cast nets less than 14' and beach or haul seines within 2" stretched mesh allowed	12" FL or 14" TL. Trip limits: April 1 until Nov. 30 - 3500 lb; Dec. 1 until 75% of adjusted quota reached – 3500 lb Mon-Fri. & 1500 lb Sat-Sun; >75% adjusted quota until quota filled -1500 lb; > 100% of adjusted quota - 500 lb.	
		Restricted Species Endorsement Required	
		Allowed gear: beach or haul seine, cast net, hook and line, or spearing.	

As of 2018

Note: commercial license required to sell Spanish mackerel in all states; other general gear restrictions effect the harvest of Spanish mackerel			
State	Recreational	Commercial	<u>Regulation Changes</u>
NY	14" TL, 15 fish	14" TL. 3,500 lb trip limit.	
NJ	14" TL, 10 fish	14" TL. 3,500 lb trip limit.	
DE	14" TL, 15 fish	14" TL. 3,500 lb trip limit.	
MD	14" TL, 15 fish	14" TL. 3,500 lb trip limit. March-Feb.	
PRFC	14" TL, 15 fish	14" TL. Closure if/when MD and VA fisheries close.	
VA	14" TL, 15 fish	14" TL. 3,500 lb trip limit.	
NC	12" FL, 15 fish	12" FL; 11.5" FL in pound net fishery July 4 th – Sept 30 th , 2018. 3,500 lb trip limit for combined Spanish and king mackerel landings.	
SC	12" FL, 15 fish	12" FL. 15 fish. 3,500 lb trip limit. March-Feb. Closure if/when federal waters close.	
GA	12" FL, 15 fish	12" FL. 3,500 lb trip limit.	In 2018, Georgia implemented a new seafood dealer license (O.C.G.A. 27-2-23 and Board Rule 391-2-4-.09).
FL	12" FL or 14" TL, 15 fish. Cast nets less than 14' and beach or haul seines within 2" stretched mesh allowed	12" FL or 14" TL. Trip limits: April 1 until Nov. 30 – 3500 lb; Dec. 1 until 75% of adjusted quota reached – 3500 lb Monday – Friday & 1500 lb Saturday – Sunday; >75% adjusted quota until quota filled – 1500 lb; > 100% of adjusted quota – 500 lb.	
		Restricted Species Endorsement Required	
		Allowed gear: beach or haul seine, cast net, hook and line, or spearing.	

As of 2019

Note: commercial license required to sell Spanish mackerel in all states; other general gear restrictions effect the harvest of Spanish mackerel			
State	Recreational	Commercial	<u>Regulation Changes</u>
NY	14" TL, 15 fish	14" TL. 3,500 lb trip limit.	
NJ	14" TL, 10 fish	14" TL. 3,500 lb trip limit.	
DE	14" TL, 15 fish	14" TL. 3,500 lb trip limit.	
MD	14" TL, 15 fish	14" TL. 3,500 lb trip limit. March-Feb.	
PRFC	14" TL, 15 fish	14" TL. Closure if/when MD and VA fisheries close.	
VA	14" TL, 15 fish	14" TL. 3,500 lb trip limit.	In 2019, Virginia proposed to amend state management of Spanish mackerel to close state waters if federal waters close, beginning in September, 2019.
NC	12" FL, 15 fish	12" FL; 11.5" FL in pound net fishery July 4 th – Sept 30 th , 2018. 3,500 lb trip limit for combined Spanish and king mackerel landings.	North Carolina discontinued its Addendum I program, which reduced the minimum size limit to 11.5 in FL for the pound net fishery from July to September, beginning in 2019.
SC	12" FL, 15 fish	12" FL. 15 fish. 3,500 lb trip limit. March-Feb. Closure if/when federal waters close.	
GA	12" FL, 15 fish	12" FL. 3,500 lb trip limit.	
FL	12" FL or 14" TL, 15 fish. Cast nets less than 14' and beach or haul seines within 2" stretched mesh allowed	12" FL or 14" TL. Trip limits: April 1 until Nov. 30 – 3500 lb; Dec. 1 until 75% of adjusted quota reached – 3500 lb Monday – Friday & 1500 lb Saturday – Sunday; >75% adjusted quota until quota filled – 1500 lb; > 100% of adjusted quota – 500 lb.	In 2019, Florida approved a rule to align their state regulations with those of the federal FMP, incorporating the step-down reductions of the in-season vessel limit as threshold levels of Spanish mackerel are harvested. This rule took effect in September, 2019.
		Restricted Species Endorsement Required	
		Allowed gear: beach or haul seine, cast net, hook and line, or spearing.	

As of 2020**No management changes were reported in 2020****References**

All information included in the previous tables were pulled from the annual state FMP compliance reports (NY-FL), and reported in annual ASMFC FMP Reviews for Spanish Mackerel.

3. Assessment History

Full stock assessments of the south Atlantic Spanish mackerel were conducted by Powers et al. (1996), Legault et al. (1998) and the Sustainable Fisheries Division (2003 and 2007). Historically, the Mackerel Stock Assessment Panel (MSAP) met regularly to oversee and review these assessments and provide advice to the SAFMC and GMFMC.

The most recent full stock assessment for south Atlantic Spanish mackerel was conducted in 2007 in SEDAR 17 using three separate models: ASPIC, BAM, and SRA. The SEDAR 17 Review Panel was presented with a base model using BAM, as neither ASPIC nor SRA were considered appropriate to produce standalone representations of the stock dynamics. The BAM was used with the following as input data: five fisheries and their corresponding age and length compositions, three fishery discard series, shrimp bycatch, seven fishery-dependent indices, two fishery-independent indices, one combined index and discard mortality rates. The base run was configured as a two sex model incorporating differences in growth by sex. Natural mortality was constant through time, but varied by age. The panel did not accept the base model of the assessment as appropriate for making biomass determinations. They concluded that there is an overall increasing trend in biomass, but that a biomass decline was observed from 2003 to 2007. The panel noted that the fishing mortality at the terminal year of the model (2007) did not seem to be inhibiting stock growth. Although the panel did not accept the model conclusions regarding biomass, they accepted model results that the stock was not undergoing overfishing. The panel remarked that the major issues with the assessment were the shrimp bycatch uncertainty, the historical recreational catch derivation, and the lack of an objective likelihood weighting method. The assessment previous to SEDAR 17 was in 2003 through the Mackerel Stock Assessment Panel (MSAP), which included data through the 2001/2002 fishing year (Sustainable Fisheries Division 2003). Estimated fishing mortality for Atlantic group Spanish mackerel was found to be below FMSY and FOY since 1995. Estimated stock abundance had increased since 1995 and was found to be at a high for the analysis period. Probabilities that the Spanish mackerel was overfished were less than 1% and that overfishing had occurred in the most recent fishing year of the assessment were 3%; therefore, the MSAP concluded that south Atlantic Spanish mackerel was not overfished and overfishing did not occur in 2002/2003.

SEDAR-28 (SEDAR-28, 2012) was a benchmark assessment using the Beaufort Assessment Model (BAM) with data through 2011. BAM is an integrated catch-age model, and is customizable to the multiple data sources available (Williams and Shertzer, 2015). A surplus production model implemented with the ASPIC software (Prager 1994, Prager 2004) was used as a complement for comparison purposes. Based on the assessment provided from the BAM, the Review Panel concluded

that the stock was not overfished and not undergoing overfishing. The stock biomass status in the base run from the BAM was estimated to be $SSB_{2011}/MSST=2.29$. The level of fishing (exploitation rate) was $F_{2009-2011}/FMSY = 0.526$, with $F_{2011}/FMSY = 0.521$. The qualitative results on terminal stock status were similar across presented sensitivity runs, indicating that the stock status results were robust given the provided data and can be used for management. The outcomes of sensitivity analyses done with BAM were in general agreement with those of the Monte Carlo Bootstrap Ensemble analysis (an additional way to examine uncertainty) in BAM. In general, stock status results from ASPIC were qualitatively similar to those from BAM.

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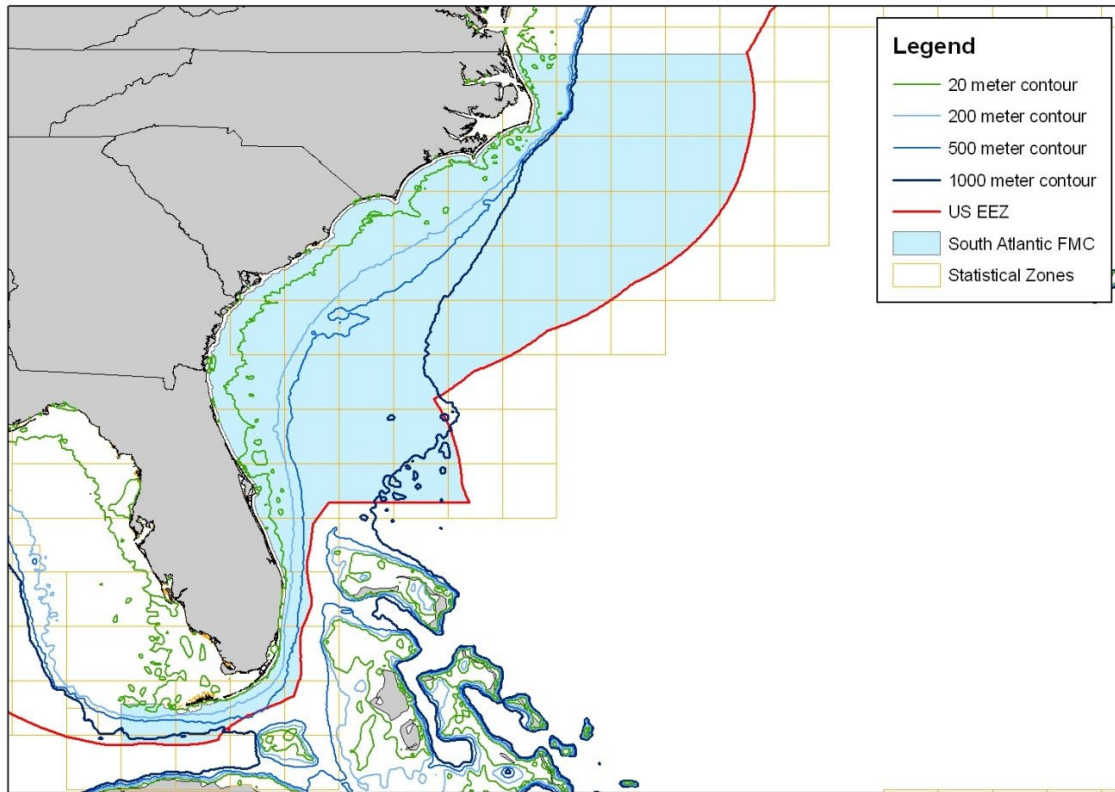
SEFSC Miami Sustainable Fisheries Division Contribution MIA-95/96-11.

Powers, J.E. and V.R. Restrepo. 1992. Additional options for age-sequenced analysis. ICCAT Coll. Vol. Sci. Pap. 39:540-553.

SEDAR. 2012. SEDAR 28 – South Atlantic Spanish mackerel Stock Assessment Report. SEDAR, North Charleston SC. 444 pp.

4. Regional Maps

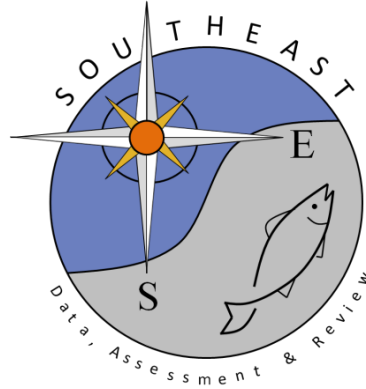
Figure 3.1: South Atlantic Fishery Management Council and EEZ boundaries.



5. Abbreviations

APAIS	Access Point Angler Intercept Survey
ABC	Allowable Biological Catch
ACCSF	Atlantic Coastal Cooperative Statistics Program
ADMB	AD Model Builder software program
ALS	Accumulated Landings System; SEFSC fisheries data collection program
AMRD	Alabama Marine Resources Division
ASMFC	Atlantic States Marine Fisheries Commission
ASPIC	a stock production model incorporating covariates
ASPM	age-structured production model
B	stock biomass level
BAM	Beaufort Assessment Model
BMSY	value of B capable of producing MSY on a continuing basis
CFMC	Caribbean Fishery Management Council
CIE	Center for Independent Experts
CPUE	catch per unit of effort
EEZ	exclusive economic zone
F	fishing mortality (instantaneous)
FMSY	fishing mortality to produce MSY under equilibrium conditions
FOY	fishing mortality rate to produce Optimum Yield under equilibrium
FXX% SPR	fishing mortality rate that will result in retaining XX% of the maximum spawning production under equilibrium conditions
FMAX	fishing mortality that maximizes the average weight yield per fish recruited to the fishery
F0	a fishing mortality close to, but slightly less than, Fmax
FL FWCC	Florida Fish and Wildlife Conservation Commission
FWRI	(State of) Florida Fish and Wildlife Research Institute
GA DNR	Georgia Department of Natural Resources
GLM	general linear model
GMFMC	Gulf of Mexico Fishery Management Council
GSMFC	Gulf States Marine Fisheries Commission
GULF FIN	GSMFC Fisheries Information Network
HMS	Highly Migratory Species

LDWF	Louisiana Department of Wildlife and Fisheries
M	natural mortality (instantaneous)
MAFMC	Mid-Atlantic Fishery Management Council
MARMAP	Marine Resources Monitoring, Assessment, and Prediction
MDMR	Mississippi Department of Marine Resources
MFMT	maximum fishing mortality threshold, a value of F above which overfishing is deemed to be occurring
MRFSS	Marine Recreational Fisheries Statistics Survey; combines a telephone survey of households to estimate number of trips with creel surveys to estimate catch and effort per trip
MRIP	Marine Recreational Information Program
MSST	minimum stock size threshold, a value of B below which the stock is deemed to be overfished
MSY	maximum sustainable yield
NC DMF	North Carolina Division of Marine Fisheries
NMFS	National Marine Fisheries Service
NOAA	National Oceanographic and Atmospheric Administration
OY	optimum yield
SAFMC	South Atlantic Fishery Management Council
SAS	Statistical Analysis Software, SAS Corporation
SC DNR	South Carolina Department of Natural Resources
SEAMAP	Southeast Area Monitoring and Assessment Program
SEDAR	Southeast Data, Assessment and Review
SEFIS	Southeast Fishery-Independent Survey
SEFSC	Fisheries Southeast Fisheries Science Center, National Marine Fisheries Service
SERO	Fisheries Southeast Regional Office, National Marine Fisheries Service
SPR	spawning potential ratio, stock biomass relative to an unfished state of the stock
SSB	Spawning Stock Biomass
SSC	Science and Statistics Committee
TIP	Trip Incident Program; biological data collection program of the SEFSC and Southeast States.
TPWD	Texas Parks and Wildlife Department
Z	total mortality, the sum of M and F



SEDAR

Southeast Data, Assessment, and Review

SEDAR 78

South Atlantic Spanish Mackerel

Section II: Assessment Report

May 2022

Revised July 2022

SEDAR
4055 Faber Place Drive, Suite 201 North Charleston, SC 29405

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May, 2022 Original release.

July, 2022 The values in tables 17, 19, and 21 were updated due to an error in the units conversion. The captions for tables 24, 25, and 26 were updated to reflect values in the tables. Text was added to a few tables to clarify discards (live, dead, or both).

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1. Introduction

This operational assessment evaluated the stock of Spanish mackerel (*Scomberomorus maculatus*) in the South Atlantic region of the southeastern United States. The primary objectives were to update and improve the 2012 SEDAR 28 benchmark assessment of and to conduct new stock projections. Using data through 2011, SEDAR 28 had indicated that the stock was not overfished and not undergoing overfishing. For this SEDAR 78 assessment, data compilation and assessment methods were guided by methodology of SEDAR 28, as well as by current SEDAR practices and recommendations by the SEDAR 28 review panel. The assessment period is 1986–2020.

Available data on this stock included indices of abundance, landings, discards, and samples of annual age compositions from fishery dependent sources. Three indices of abundance were fitted by the model: one from the Florida commercial trip tickets, one from the recreational MRIP intercepts for harvested fish, and one from the age-0 SEAMAP Coastal Trawl Survey. Data on landings and discards were modeled from five distinct fleets and two bycatch series: commercial handline, commercial gillnet, commercial pound net, commercial cast net, and general recreational (shore, private and charter modes) landings and discards.

The primary model used in SEDAR 28—and the one updated here—was the Beaufort Assessment Model (BAM), an integrated statistical catch-age formulation. A base run of BAM was configured to provide point estimates of key management quantities, such as stock and fishery status. Uncertainty in estimates from the base run was evaluated through a mixed Monte Carlo/Bootstrap Ensemble (MCBE) procedure. Median values from the uncertainty analysis are also provided. Sensitivity runs were developed to evaluate the model at the MCBE bounds for fixed natural mortality, steepness, and general recreational discard mortality parameters as well as exclusion of the commercial handline index.

The assessment estimated that spawning stock has fluctuated on a near-decadal cycle near or above the minimum stock size threshold (MSST) level. The base-run estimate of terminal (2020) spawning stock was above the MSST ($SSB_{2020}/MSST = 1.40$), as was the median estimate from the MCBE ($SSB_{2020}/MSST = 1.42$). The estimated fishing rate has been at or below the maximum fishing mortality threshold (MFMT), represented by F_{MSY} with the exception of the terminal year (2020). The terminal estimate, which is based on a three-year geometric mean, was below F_{MSY} in the base run ($F_{2018-2020}/F_{MSY} = 0.77$) and in the median of the MCBE ($F_{2018-2020}/F_{MSY} = 0.74$). Thus, this assessment indicated that the stock is not experiencing overfishing. However, this result requires caution: if the overfishing rate of 2020 continued in 2021, the geometric mean would indicate overfishing.

The MCBE analysis illustrated that these estimates of stock and fishery status are robust. Of all MCBE runs, 92.6% were in agreement that the stock is not overfished, and 90.0% were in agreement that overfishing is not occurring. Although qualitative results were robust, the primary sources of uncertainty in quantitative results (i.e., degree of overfishing or overfished) was natural mortality and steepness.

The estimated trends of this operational assessment were quite similar to those from the SEDAR28 benchmark. However, the two assessments did show some differences in results, which was not surprising given several modifications made to both the data and the model (described throughout the report). The two assessments showed similar stock status between 1986 and 2011, the terminal year of SEDAR28. Since then, SEDAR 78 indicated that the Spanish mackerel stock has fluctuated near the MSY reference point.

1.1 Workshop Time and Place

The SEDAR 78 South Atlantic Spanish Mackerel assessment took place over a series of webinars held from May 2021 to March 2022.

1.2 Terms of Reference

1. Update the approved SEDAR 28 Spanish Mackerel model with data through 2020. Apply the current BAM configuration incorporating approved improvements developed since SEDAR 28.
2. Evaluate and document the following specific changes in input data or deviations from the benchmark model.
 - Update growth and reproductive models if additional samples are available for fish below 275 mm
 - If available, include any improved information on steepness for similar pelagic species.
 - Evaluate data uncertainty with respect to the recreational landings
 - Calculate different F metrics (in addition to apical F) (to address shifts in the age of apical F towards the end of the assessment time series).
3. Document any changes or corrections made to model and input datasets and provide updated input data tables. Provide commercial and recreational landings and discards in pounds and numbers.
4. Update model parameter estimates and their variances, model uncertainties, estimates of stock status and management benchmarks, and provide the probability of overfishing occurring at specified future harvest and exploitation levels.
5. Convene a working group including SSC representatives to meet via webinar, as needed to review model development relative to terms of reference 1 through 4.
6. Develop a stock assessment report to address these ToRs and fully document the input data, methods, and results.

1.3 List of Participants

Appointee	Function	Affiliation
Rob Cheshire	Lead Analyst	SEFSC Beaufort
Matthew Vincent	Analytical Team	SEFSC Beaufort
Matt Nuttall	Analytical Team	SEFSC Miami
Kyle Shertzer	Analytical Team	SEFSC Beaufort
Chris Palmer	Analytical Team	SEFSC Panama City
Naeem Willet	Analytical Team	SEFSC Panama City
Ashley Pacicco	Analytical Team	SEFSC Panama City
Vivian Matter	Analytical Team	SEFSC Miami
Refik Orhun	Analytical Team	SEFSC Miami
Kevin McCarthy	Analytical Team	SEFSC Miami
Eric Fitzpatrick	Data Compiler	SEFSC Beaufort
Mike Rinaldi	Panelist	ACCSP
Alan Bianchi	Panelist	NCDMF
Tracy Smart	Panelist	SCDNR
Amy Zimney	Panelist	SCDNR
Mclean Seward	Panelist	NCDMF
Dustin Addis	Panelist	SSC
Wilson Laney	Panelist	SSC
Fred Scharf	Panelist	SSC
Appointed Observers		
Thomas Newman	Observer	MCAP
Greg Peralta	Observer	MCAP
Appointed Council Members		
Tom Roller	Observer	MCAP AND SAFMC
Staff		
Kathleen Howington	Coordinator	SEDAR
Judd Curtis	Staff Representative	SAFMC
Alishia Gray	Staff Representative	SERO
Non-Panel Data Providers		
Steve Brown	Data Provider	FLFWC
Chris Bradshaw	Data Provider	FLFWC
Eric Hiltz	Data Provider	SCDNR
Amy Dukes	Data Provider	SCDNR
Dominique Lazzare	Data Provider	FLFWC
Andrew Cathey	Data Provider	NCDMF
Ken Brennen	Data Provider	SEFSC Beaufort
John Carlson	Data Provider	SEFSC Panama City
Alyssa Mathers	Data Provider	SEFSC Panama City
Bradley Smith	Data Provider	SEFSC Panama
Appointee	Function	Affiliation
Non-Panel Data Providers		
Stephanie Martinez	Data Provider	SEFSC Miami
Liz Scott-Denton	Data Provider	SEFSC Pascagoula
Larry Beerkircher	Data Provider	SEFSC Miami
Beverly Sauls	Data Provider	FLFWC
Kelly Fitzpatrick	Data Provider	SEFSC Beaufort

Other		
Adyan Rios	Observer	NMFS
Chip Collier	Observer	SAFMC
Alan Lowther	Observer	NMFS
Beverly Barnett	Observer	NMFS
Brandon Foor	Observer	NMFS
Beverly Barnett	Observer	NMFS
Emilie Franke	Observer	ASMFC
Chris Swanson	Observer	FLFWC
Derek Cox	Observer	FLFWC
Elizabeth Gooding	Observer	SCDNR
Greg Peralta	Observer	Fisherman
Hannah Hart	Observer	FLFWC
Ira Laks	Observer	Fisherman
Jeff Pulver	Observer	NMFS
Jennifer Potts	Observer	NMFS
Julie Defilippi Simpson	Observer	ACCSP
Katie Drew	Observer	ASMFC
Rusty Hudson	Observer	Fisherman
Savannah Lewis	Observer	ASMFC
Scott Crosson	Observer	NMFS
Willow Patten	Observer	NCDMF

1.4 Document List

Document #	Title	Authors	Received
Documents Prepared for SEDAR 78			
SEDAR78-WP01	SEAMAP-SA Coastal Trawl Survey Data and Sample Collection Methods	Amy Zimney	7/29/2021
SEDAR78-WP02	Spanish Mackerel Indices of Abundance in U.S. South Atlantic Waters Based on the SEAMAP-SA Fishery-independent Coastal Trawl Survey	Tracey Smart and Amy Zimney	10/29/2021
SEDAR78-WP03	General Recreational Survey Data for Spanish Mackerel in the South Atlantic	Matt Nuttall	10/25/2021
SEDAR78-WP04	SEDAR 78 Spanish mackerel bycatch estimates from US Atlantic coast shrimp trawls	Eric Fitzpatrick	11/10/2021
SEDAR78-WP05	General recreational and commercial age and length composition weighting for Southeast U.S. Spanish mackerel (<i>Scomberomorus maculatus</i>)	Eric Fitzpatrick	11/10/2021
SEDAR78-WP06	Bycatch estimates of Spanish mackerel in the south Atlantic coastal gillnet fishery	John Carlson, Alyssa Mathers and Kevin McCarthy	10/28/2021
SEDAR78-WP07	Standardized Catch Rates of Spanish mackerel from the Southeast Coastal Gillnet Fishery	John Carlson and Alyssa Mathers	10/29/2021
SEDAR78-WP08	A Review of Atlantic Spanish mackerel (<i>Scomberomorus maculatus</i>) Age Data, 1986 – 2020, From Various Age-data Sources	Chris Palmer, Jennifer Potts, Beverly Barnett, and Rob Cheshire	10/29/2021
SEDAR78-WP09	Fishery-dependent CPUE index for Spanish mackerel derived from MRIP data	Katie Drew	10/29/2021
SEDAR78-WP10	Spanish Mackerel Length Frequency Distributions from At-Sea Headboat and Charter Observer Surveys in the South Atlantic, 2005 to 2020.	Dominique Lazarre Andrew Cathey and Kelly Fitzpatrick	11/3/2021

Document #	Title	Authors	Received
Documents Prepared for SEDAR 78 Cont.			
SEDAR78-WP11	Discards of Spanish Mackerel Calculated for Commercial Fishing Vessels with Federal Fishing Permits in the US South Atlantic	Kevin McCarthy and Jose Diaz	11/4/2021
SEDAR78-WP12	Annual indices of abundance of Spanish Mackerel from Florida commercial trip tickets, 1986-2020	Joe O'Hop and Steve Brown	11/12/2021
Final Assessment Report			
SEDAR78-SAR1	Assessment of South Atlantic Spanish Mackerel	To be prepared by SEDAR 78	May 2022

1.5 Statements Addressing Each Terms of Reference

Note: Original ToRs are in normal font. Statements addressing ToRs are in italics.

1. Update the approved SEDAR 28 Spanish mackerel model with data through 2020. Apply the current BAM configuration incorporating approved improvements developed since SEDAR 28.

SEDAR78 applied the current BAM configuration. The assessment model structure and data sources were very similar to those used in SEDAR28. Important modifications, such as selectivity functions were investigated through likelihood profiles and visual comparisons of model fit to the data. The decision to remove sex-specific growth and selectivity and modify the start year for the model were evaluated and shown to improve model performance.

2. Evaluate and document the following specific changes in input data or deviations from the benchmark model.
 - Update growth and reproductive models if additional samples are available for fish below 275 mm.
 - If available, include any improved information on steepness for similar pelagic species.
 - Evaluate data uncertainty with respect to the recreational landings.
 - Calculate different F metrics (in addition to apical F) (to address shifts in the age of apical F towards the end of the assessment time series).

All the above bullet points were addressed. Growth models were developed with increased age-0 samples primarily from the SEAMAP Coastal Trawl Survey. There was very limited reproduction information. There was no new information on steepness that could be applied in this assessment. Likelihood profiles on steepness had similar results to SEDAR28. Uncertainty in recreational landings was presented in the associated working paper. Years with large increases, such as 2020, were evaluated and discussed in greater detail. The spawning potential ratio conditional on annual F and exploitation rates were examined as additional F metrics.

3. Document any changes or corrections made to model and input datasets and provide updated input data tables. Provide commercial and recreational landings and discards in pounds and numbers.

Changes to data and model are documented in the report, along with tables of updated data input and removals in both pounds and numbers.

4. Update model parameter estimates and their variances, model uncertainties, estimates of stock status and management benchmarks, and provide the probability of overfishing occurring at specified future harvest and exploitation levels.

All of these key estimates and outputs are documented in the report.

5. Convene a working group including SAFMC Science and Statistical Committee representatives to meet via webinar, as needed to review model development relative to terms of reference 1 through 4.

The SEDAR78 panel did not suggest working groups were needed during model development.

6. Develop a stock assessment report to address these TORs and fully document the input data, methods, and results.

Please see this report.

2 Data Review and Update

The input data for this assessment are described below, with focus on modifications from the SEDAR 28 benchmark assessment.

2.1 Data Review

In this operational assessment, the Beaufort assessment model (BAM) was fitted to data sources developed during the SEDAR 78 process, evaluated over several webinars. These data include updates to SEDAR 78 data, where appropriate, which are highlighted below.

Model inputs used in SEDAR 28 and SEDAR 78

- Life history: Meristics, population growth, fishery dependent size at age, female size at age, female maturity, proportion female, age-dependent natural mortality
- Landings and discards: Commercial handline, gillnet, pound net, and cast net combined landings and discards, shrimp bycatch, general recreational landings and discards
- Indices of abundance: Commercial handline, MRIP, SEAMAP YOY ¹
- Age compositions: Commercial handline, gillnet, pound net, and cast net landings, and general recreational landings
- Other: General recreational discard mortality

Updated data sources in SEDAR 78

- Life history: Population growth, fishery dependent size at age, female size at age, age-dependent natural mortality
- Landings and discards: Commercial handline, gillnet, pound net, and cast net combined landings and discards, shrimp bycatch, general recreational landings and discards
- Indices of abundance: Commercial handline, MRIP, SEAMAP YOY
- Age compositions: Commercial handline, gillnet, pound net, cast net, and general recreational

2.2 Data Update

2.3 Life History

A total of 32,348 (1986 — 2020) Spanish mackerel ages were prepared for SEDAR 78. Several data sources reevaluated age sample information for the entire time series. Gear identification was improved for some fishery dependent samples and deemed unreliable for others. In addition, many more YOY samples were collected since SEDAR 28 primarily from the SEAMAP Coastal Trawl Survey (see SCDNR sample sizes, mostly age-0 and age-1 fish, in SEDAR78-WP08 (2021)).

Estimates of the von Bertalanffy growth parameters updated for the population as a whole ($L_{\infty} = 582.5$ mm, $K = 0.6$ yr⁻¹, and $t_0 = -0.5$ yr), the female population ($L_{\infty} = 610.1$ mm, $K = 0.62$ yr⁻¹, and $t_0 = -0.5$ yr), and the fished

¹Abbreviations and acronyms used in this report are defined in Appendix A

population ($L_\infty = 680.4$ mm, $K = 0.2$ yr⁻¹, and $t_0 = -2.77$ yr). For the population as a whole and the female population, the t_0 parameter was fixed, samples were weighted by the inverse of the number of samples at age, and a correction was applied for bias from fishery dependent samples (Diaz et al. 2004). Length at age for all growth models are given in Table 1.

Age-based (Lorenzen 1996) natural mortality estimates were updated using new population growth parameters for SEDAR 78. As in SEDAR28, the cumulative survival of age 2+ based on a point estimate of natural mortality, 0.35, was used to scale the age-based estimates of natural mortality (Table 1).

2.4 Landings

The fleet structure used in SEDAR 78 was the same as that of SEDAR 28, including commercial handline, gill net, cast net, pound net, and general recreational (including estimates of headboat and MRIP private, charter, and shore-based landings). General recreational landings and discards were estimated using the current MRIP methodology (SEDAR78-WP03 2021). The commercial estimated landings were input as whole pounds. The commercial “other” estimated landings were divided between commercial gears based on the annual proportion of each (Table 2). General recreational landings were input in numbers (thousands).

2.5 Discards and Bycatch

Discards were estimated for commercial gill net, handline, and trolling (included with handline) in numbers (SEDAR78-WP11 2021). The commercial discards were converted to pounds based on the average weight of fish less than the 12 inch size limit weighted by the observed proportion in the overall length composition. These minor removals were then combined with their respective catch time series. General recreational discards were estimated in numbers and were modeled separately as in SEDAR 28 (Table 2, SEDAR78-WP03 (2021)). Spanish mackerel are observed in the shrimp trawl fishery in the South Atlantic. Shrimp bycatch estimates were developed using methods consistent with SEDAR 28 (SEDAR78-WP04 2021). General recreational discards and shrimp bycatch were developed in numbers as input to the model (Table 2).

2.6 Indices of Abundance

Two fishery dependent indices and one fishery independent recruitment index were developed for SEDAR 78. The general recreational MRIP index and associated CVs for harvested fish were updated through 2020 (SEDAR78-WP09 2021). This index was later truncated to start in 1986 and renormalized to its mean to coincide with the start year of the model. An index from Florida commercial handline trip ticket records was developed (SEDAR78-WP12 2021). A recruitment index of age-0 fish from the SEAMAP Coastal Trawl Survey was formulated for 1989–2019 (SEDAR78-WP01 2021; SEDAR78-WP02 2021). All finalized indices for potential use in the Spanish mackerel stock assessment and associated CVs are in Table 3.

2.7 Length Composition

As in SEDAR 28, length data were not used to inform the model. However, length compositions can be used to remove bias in samples collected for age determination. Only the commercial gillnet collections had adequate samples to develop weighted length composition data (SEDAR78-WP05 2021). This composition was developed solely to weight the commercial gillnet age composition.

2.8 Age Composition

Age data were available from the commercial handline, pound net, gill net, cast net and general recreational sampling programs. Nominal age compositions were developed for Spanish mackerel except commercial gillnet which was weighted by the length composition (Chih 2009; SEDAR78-WP05 2021). Ages greater than 10 were pooled to age 10 creating a plus group (age 10+; Tables 4–8).

3 Stock Assessment Methods

3.1 Overview

This operational assessment updated the primary model applied in SEDAR28 (2012), an integrated model implemented using the BAM software (Williams and Shertzer 2015). BAM applies a statistical catch-age formulation, coded in AD Model Builder (Fournier et al. 2012). BAM is referred to as an integrated model because it uses multiple data sources relevant to population and fishery dynamics (e.g. removals, length and age compositions, and indices of abundance) in a single framework. In essence, the catch-age model simulates a population forward in time while including fishing processes (Quinn and Deriso 1999; Shertzer et al. 2008). The model is similar in structure to Stock Synthesis (Methot and Wetzel 2013) and other stock assessment models used in the United States (Dichmont et al. 2016; Li et al. 2021). Versions of BAM have been used in previous SEDAR assessments of reef fishes in the U.S. South Atlantic, such as black sea bass, blueline tilefish, gag, greater amberjack, red grouper, red porgy, snowy grouper, tilefish, and vermilion snapper, as well as in the previous SEDAR assessments of Spanish mackerel (SEDAR17 2008; SEDAR28 2012). The primary model in this assessment was a statistical catch-age model (Quinn and Deriso 1999), implemented with the AD Model Builder software (ADMB Foundation 2012). Statistical catch-age models share many attributes with ADAPT-style tuned and untuned VPAs.

3.2 Data Sources

The catch-age model was fit to data from one fishery independent recruitment index, two fishery dependent indices, estimates of bycatch in the shrimp fishery, and to data from each of the five primary fisheries on southeastern U.S. Spanish mackerel: commercial gill net, commercial pound net, commercial cast net, commercial handlines (including hook & line, trolling, and electric reels), and general recreational (including headboat). These data included annual landings by fishery (in total weight for commercial and in numbers for general recreational and shrimp bycatch), annual discards from the general recreational sector, and annual age composition of landings by fishery. Discards from the commercial fisheries were added to landings as they were not a large enough proportion of total catch to model separately (Table 2). Data on annual discard mortalities were not available, but an overall discard mortality rate of 0.2 for the general recreational sector was applied to total discards as per the recommendation of the SEDAR 28 DW. All shrimp bycatch was assumed dead.

3.3 Model Configuration

The assessment time period was 1986–2020. The initial year was modified from SEDAR 28 to begin when adequate information was available to inform the initial age structure of the population and fishing rates. These values were assumed and fixed in SEDAR 28 and age compositions are not available until 1990. SEDAR 28 had to make assumptions about population age structure and fishing mortality to initialize the model in 1950. The terminal year extended from 2012 to 2020. A general description of the assessment model follows.

3.4 Stock Dynamics

In the assessment model, new biomass was acquired through growth and recruitment, while abundance of existing cohorts experienced mortality from fishing and natural sources. The population was assumed closed to immigration and emigration. The model included age classes $0 - 10^+$, where the oldest age class 10^+ allowed for the accumulation of fish (i.e., plus group).

3.5 Initialization

Initial (1986) numbers at age assumed the stable age structure computed from expected recruitment and the initial, age-specific total mortality rate. That initial mortality was the sum of natural mortality and fishing mortality, where fishing mortality was the product of an initial fishing rate (F_{init}) and F -weighted selectivity based on starting year landings. The initial fishing rate was estimated using a starting value of $F_{init} = 0.5$ and no prior. The initial recruitment in 1986 was estimated.

3.6 Natural Mortality Rate

The natural mortality rate (M) was assumed constant over time, but decreasing with age. The form of M as a function of age was based on Lorenzen (1996). The Lorenzen (1996) approach inversely relates the natural mortality at age to mean weight at age W_a by the power function $M_a = \alpha W_a^\beta$, where α is a scale parameter and β is a shape parameter. Lorenzen (1996) provided point estimates of α and β for oceanic fishes, which were used for this assessment. As in previous SEDAR assessments, the age-dependent estimates of M_a were rescaled to provide the same fraction of fish surviving from age 2 through the oldest observed age (12 yr) as would occur with constant $M = 0.35$, which is consistent with the findings of Hoenig (1983) and discussed in Hewitt and Hoenig (2005). The scaled Lorenzen estimator has become common in SEDAR assessments as the most reliable approach to infer age-dependent natural mortality.

3.7 Growth

Mean size at age of the population, female population, and fishery removals under a 12-inch size limit (fork length, FL) were modeled with the von Bertalanffy equation, and weight at age (whole weight, WW) was modeled as a function of FL (Figure 1, Table 1). Parameters of growth and conversions (FL-WW) were treated as input to the assessment model.

3.8 Female Maturity and Sex Ratio

Female maturity was modeled with a logistic function; parameters for this model and a vector of maturity at age were provided by the SEDAR 28 DW and treated as input to the assessment model (Table 1). The sex ratio was assumed to be 50:50, as in SEDAR 28.

3.9 Spawning Biomass

Spawning biomass (in units of mt) was modeled as the mature female biomass. It was computed each year from number at age when spawning peaks. For Spanish mackerel, peak spawning was considered to occur on June 1st.

3.10 Recruitment

Recruitment was predicted from spawning biomass using a Beverton–Holt spawner-recruit model. These stock-recruit parameters are median-unbiased values (Li et al. 2021). For all years in the model (1986–2020), estimated recruitment was conditioned on the Beverton–Holt model. Steepness was fixed at 0.75 for the base run.

3.11 Landings

Time series of landing from five fisheries were modeled: commercial handlines, commercial gillnet, commercial pound net, commercial cast net, and general recreational (including headboat). Landings were modeled via the Baranov catch equation (Baranov 1918), in units of 1000 lb whole weight for commercial fisheries and in units of 1000 fish for the general recreational fishery and bycatch.

3.12 Discards

Starting in 1986 with the implementation of size-limit regulations, time series of discard mortalities (in units of 1000 fish) were available for commercial handline and gill net fisheries. The magnitude of the commercial discards was trivial in comparison to the landings. As a result, the commercial discards were included with the landings rather than model the discards separately. General recreational discards were modeled separately and decremented by the discard mortality rate (0.2) determined in SEDAR 28. As with landings, discard mortalities were modeled via the Baranov catch equation (Baranov 1918), which required estimates of discard selectivities (described below) and release mortality rates.

3.13 Bycatch

Spanish mackerel are observed in the shrimp trawl fishery in the South Atlantic. However, the observer coverage is extremely sparse and effort data are questionable. Estimates were provided by the data workshop that assumed a constant relationship over time between the rate of bycatch and effort by state (SEDAR78-WP04 2021). Bycatch was modeled via the Baranov catch equation (Baranov 1918), assuming that only age 0 fish and a small proportion of age 1 fish were selected with 100% mortality.

3.14 Fishing

For each time series of landings and discard mortalities, a separate full fishing mortality rate (F) was estimated. Age-specific rates were then computed as the product of full F and selectivity at age. The across-fleet annual F was represented by apical F , computed as the maximum of F at age summed across fleets.

3.15 Selectivities

Selectivity curves applied to landings were estimated using a parametric approach. This approach applies plausible structure on the shape of the curves, and achieves greater parsimony than occurs with unique parameters for each age. Flat-topped selectivities were modeled as a two-parameter logistic function (logistic). Dome-shaped selectivities were modeled by combining two logistic functions: a two-parameter logistic function to describe the ascending limb of the curve, and a two-parameter logistic function to describe the descending limb (double-logistic). Another type of domed-shaped selectivity allowed for a freely estimated logit parameter for age-0, a fixed peak at age-1, and an exponential decline for age 2⁺ (logit-exponential).

To model landings, this assessment applied flat-topped selectivity for the commercial handline and cast net fleets, both pooled over years due to small sample sizes. Dome-shaped selectivity was used to model commercial gillnet landings. Commercial pound net and general recreational fleets were modeled using the logit-exponential selectivity. The approach to modeling each of these fleets was modified from decisions in SEDAR 28 to improve model fit and stability and based on total likelihood or likelihood profiles of specific parameters.

Selectivities of general recreational discards and shrimp bycatch could not be estimated directly, because composition data of discards were lacking. Fixed selectivities for these removals were the same as in SEDAR 28.

3.16 Indices of Abundance

The model was fit to two fishery dependent indices of relative abundance (MRIP (1986–2020) and commercial handline (1986–2020)), and one fishery independent index of age-0 recruitment (SEAMAP YOY (1989–2019)). The fishery dependent indices of abundance were limited to harvested fish. Predicted indices were conditional on selectivity of the corresponding fleet, and were computed from abundance (numbers of fish) at the midpoint of the year or, in the case of commercial handlines, biomass.

3.17 Catchability

In the BAM, catchability scales indices of relative abundance to the estimated population at large, adjusted by selectivity of the fleet or survey. For SEDAR 78, as in SEDAR 28, catchability (q) of each index was assumed to be time-invariant, and these parameters (one q per index) were estimated within BAM.

3.18 Biological Reference Points

Biological reference points (benchmarks) were calculated based on maximum sustainable yield (MSY) estimates from the Beverton-Holt spawner-recruit model with bias correction (expected values in arithmetic space). Computed benchmarks included MSY, fishing mortality rate at MSY (F_{MSY}), and spawning stock at MSY (SSB_{MSY}). In this assessment, spawning stock measures total biomass (mt) of mature females. These benchmarks are conditional on the estimated selectivity functions. The selectivity pattern used here were the selectivities at age (weighted by apical F), with effort from each fishery (including discard and bycatch mortalities) estimated as the full F averaged over the last three years of the assessment.

3.19 Fitting Criterion

Model parameters were estimated using a penalized likelihood approach in which observed removals (landings and discards) were fit closely, and observed composition data and abundance indices were fit to the degree that they were compatible. Removals and index data were fit using lognormal likelihoods. Age composition data were fit using the Dirichlet-multinomial likelihood, and only from years that met minimum sample size criteria ($n_{fish} > 10$ and $n_{trips} \geq 10$).

SEDAR 28 fit composition data using the robust multinomial with iterative re-weighting (Francis 2011). Since Francis (2011), additional work on this topic has questioned the use of the multinomial distribution in stock assessment models (Francis 2014), and has recommended the Dirichlet-multinomial as an alternative (Francis 2017; Thorson et al. 2017; Fisch et al. 2021). A chief advantage of the Dirichlet-multinomial is that it is self-weighting through estimation of an additional variance inflation parameter for each composition component, making iterative re-weighting unnecessary. Another advantage is that it can better account for overdispersion, or, larger variance in the data than would be expected by the multinomial. Overdispersion can result from intra-haul correlation, which results when fish caught in the same set are more alike in length or age than fish caught in a different set (Pennington and Volstad 1994). The Dirichlet-multinomial has been implemented in Stock Synthesis (Methot and Wetzel 2013; Thorson et al. 2017) and in the BAM, and since SEDAR 41 has become the standard likelihood for fitting composition data in assessments of South Atlantic fishes.

The model includes the capability for each component of the likelihood to be weighted by user-supplied values. When applied to indices, these weights modified the effects of the CVs derived from index standardization. CVs from index standardization are often smaller for fishery dependent indices than for fishery independent indices due to the typically larger sample sizes. Therefore, initial CVs for the fishery dependent indices were set to 0.2, similar to past SEDAR assessments, to ensure that the fishery independent index was not considered less certain than the fishery dependent index. In the base run, weights on the indices were adjusted iteratively from the initial values based on the index standardization (Table 3) until standard deviations of normalized residuals (SDNRs) were near 1.0, as recommended by Francis (2011).

For some parameters defining selectivities and Dirichlet-multinomial overdispersion parameters, normal priors were applied to maintain parameter estimates near reasonable values, and to prevent the gradient-based optimization routine from drifting into parameter space with negligible changes in the likelihood.

3.20 Configuration of a Base Run

The base run was configured as described above. This configuration does not necessarily represent reality better than all other possible configurations, and thus this assessment attempted to portray uncertainty in point estimates through sensitivity analyses and through a MCBE approach (described below).

3.21 Sensitivity Analyses

Sensitivity runs were chosen to investigate issues that arose specifically with this operational assessment. They were intended to demonstrate directionality of results with changes in inputs or simply to explore model behavior. These model runs vary from the base run as follows:

- S1: Removal of the commercial handline index
- S2: Use the Lorenzen M scaled to the low point estimate of M

- S3: Use the Lorenzen M scaled to the high point estimate of M
- S4: Steepness fixed at 0.6
- S5: Steepness fixed at 0.9
- S6: General recreational discard rate fixed at 0.1
- S7: General recreational discard rate fixed at 0.3

Retrospective analyses were also conducted by incrementally dropping one year at a time for five iterations. In these runs, the terminal years were 2019, 2018, 2017, 2016, or 2015.

3.22 Parameters Estimated

The model estimated annual fishing mortality rates of each fleet, selectivity parameters, catchability coefficients associated with indices, parameters of the mean recruitment model (R_0), annual recruitment deviations, and Dirichlet-multinomial variance inflation factors. Estimated parameters are listed in Appendix B.

3.23 Per Recruit and Equilibrium Analyses

Yield per recruit and spawning potential ratio were computed as functions of F , as were equilibrium landings, discards, and spawning biomass. Equilibrium landings and discards were also computed as functions of biomass B , which itself is a function of F . As in the computation of MSY-related benchmarks (described in §3.24), per recruit and equilibrium analyses applied the most recent selectivity patterns averaged across fleets, weighted by each fleet's F from the last three years of the assessment (2018–2020).

3.24 Benchmark/Reference Point Methods

In this assessment of Spanish mackerel, the quantities F_{MSY} , SSB_{MSY} , B_{MSY} , and MSY were estimated by the method of Shepherd (1982). In that method, the point of maximum yield is calculated from the spawner-recruit curve and parameters describing growth, natural mortality, maturity, and selectivity. The value of F_{MSY} is the F that maximizes equilibrium removals.

On average, expected recruitment is higher than that estimated directly from the spawner-recruit curve, because of lognormal deviation in recruitment. Thus, in this assessment, the method of benchmark estimation accounted for lognormal deviation by including a bias correction in equilibrium recruitment. The bias correction (ς) was computed from the variance (σ_R^2) of recruitment deviation in log space: $\varsigma = \exp(\sigma_R^2/2)$. Then, equilibrium recruitment (R_{eq}) associated with any F is,

$$R_{eq} = \frac{R_0 [\varsigma 0.8h\Phi_F - 0.2(1-h)]}{(h-0.2)\Phi_F} \quad (1)$$

where R_0 is virgin recruitment, h is steepness, and $\Phi_F = \phi_F/\phi_0$ is spawning potential ratio given growth, maturity, and total mortality at age (including natural and fishing mortality rates). The R_{eq} and mortality schedule imply an equilibrium age structure and an average sustainable yield (ASY). The estimate of F_{MSY} is the F giving the highest ASY, and the estimate of MSY is that ASY. The estimate of SSB_{MSY} follows from the corresponding equilibrium age structure, as does the benchmark estimate of discard mortalities (D_{MSY}), here separated from ASY (and consequently, MSY).

Estimates of MSY and related benchmarks are conditional on selectivity pattern. The selectivity pattern used here was an average of terminal-year selectivities from each fleet, where each fleet-specific selectivity was weighted in proportion to its corresponding estimate of F averaged over the last three years (2018–2020). If the selectivities or relative fishing mortalities among fleets were to change, so would the estimates of MSY and related benchmarks.

For this stock, the maximum fishing mortality threshold (MFMT) is defined by the SAFMC as F_{MSY} , and the minimum stock size threshold (MSST) as $75\% \text{SSB}_{\text{MSY}}$. Overfishing is defined as $F > \text{MFMT}$ and overfished as $\text{SSB} < \text{MSST}$. Current status of the stock is represented by SSB in the latest assessment year (2020), and current status of the fishery is represented by the geometric mean of F from the latest three years (2018–2020).

3.25 Uncertainty and Measures of Precision

As in SEDAR 28, this assessment used a MCBE approach to characterize uncertainty in results of the base run. Monte Carlo and bootstrap methods (Efron and Tibshirani 1993; Manly 1997) are often used to characterize uncertainty in ecological studies, and the mixed approach has been applied successfully in stock assessment, including Restrepo et al. (1992), Legault et al. (2001), SEDAR4 (2004), and many South Atlantic SEDAR assessments since SEDAR19 (2009). The approach is among those recommended for use in SEDAR assessments (SEDAR Procedural Guidance 2010), and it is considered to be one of the more complete characterizations of uncertainty used in stock assessments across the United States.

The approach translates uncertainty in model input into uncertainty in model output, by fitting the model many times with different values of “observed” data and key input parameters. A main advantage of the approach is that the results describe a range of possible outcomes, so that the ensemble of models characterizes uncertainty in results more thoroughly than any single fit or handful of sensitivity runs (Scott et al. 2016; Jardim et al. 2021). A minor disadvantage of the approach is that computational demands are relatively high, but this can largely be mitigated through use of parallel processing.

In this assessment, the BAM was successively re-fit in $n = 4000$ trials that differed from the original inputs by bootstrapping on data sources, and by Monte Carlo sampling of several key input parameters. The value of $n = 4000$ was chosen because a minimum of 3000 runs were desired, and it was anticipated that not all runs would converge or otherwise be valid. Of the 4000 trials, approximately 1% were discarded, because the model did not properly converge (the Hessian was not positive definite or a parameter hit a bound). This left $n = 3957$ MCBE runs to characterize uncertainty, which was sufficient for convergence of standard errors in management quantities. All runs were given equal weight when forming the ensemble of results (Jardim et al. 2021).

The MCBE analysis should be interpreted as providing an approximation to the uncertainty associated with each output. The results are approximate for two related reasons. First, not all combinations of Monte Carlo parameter inputs are equally likely, as biological parameters might be correlated. Second, all runs are given equal weight in the results, yet some might provide better fits to data than others.

3.26 Bootstrap of Observed Data

To include uncertainty in time series of observed landings, discards, and indices of abundance, multiplicative lognormal errors were applied through a parametric bootstrap. To implement this approach in the MCB trials, random variables ($x_{s,y}$) were drawn for each year y of time series s from a normal distribution with mean 0 and variance $\sigma_{s,y}^2$ [that is, $x_{s,y} \sim N(0, \sigma_{s,y}^2)$]. Annual observations were then perturbed from their original values ($\hat{O}_{s,y}$),

$$O_{s,y} = \hat{O}_{s,y} [\exp(x_{s,y} - \sigma_{s,y}^2/2)] \quad (2)$$

The term $\sigma_{s,y}^2/2$ is a bias correction that centers the multiplicative error on the value of 1.0. Standard deviations in log space were computed from CVs in arithmetic space, $\sigma_{s,y} = \sqrt{\log(1.0 + CV_{s,y}^2)}$. As used for fitting the base run, CVs of landings and discards were assumed to be 0.05, and CVs of indices of abundance were those provided by, or modified from, the DW (tabulated in §2 of this assessment report).

Uncertainty in age compositions were included by drawing new distributions for each year of each data source, following a multinomial sampling process. Ages of individual fish were drawn at random with replacement using the cell probabilities of the original data. For each year of each data source, the number of individuals sampled was the same as in the original data (number of fish).

3.27 Monte Carlo Sampling

In each successive fit of the model, several parameters were fixed (i.e., not estimated) at values drawn at random from distributions. The steepness, natural mortality, and general recreational discard mortality distributions are described below.

3.28 Steepness

As in SEDAR 28, steepness could not be estimated with stability in the model. Steepness values above 0.60 appeared to be equally likely in the likelihood profile. Steepness was fixed at 0.75 for the base run and uncertainty in the parameters was characterized by a truncated normal distribution with 0.6 and 0.9 as the lower and upper bounds respectively.

3.29 Natural Mortality

As in each model run, the vector of age-specific natural mortality (Lorenzen estimator) was scaled to the fish-only Hoenig (1983) age-invariant M as was done for the base run. The point estimate of natural mortality ($M = 0.35$) was based on a maximum age of 12. To estimate uncertainty, a new M value was drawn for each MCB trial from a truncated normal distribution of (range [0.30, 0.42]) with mean equal to the point estimate ($M = 0.35$) and standard deviation set to provide 95% confidence limits at the bounds. The range was reduced from SEDAR 28 and corresponds to maximum age $+/- 2$ instead of the range of point estimates across many different methods to calculate M (range [0.16, 0.54]). Each realized value of M was used to scale the age-specific Lorenzen M , as in the base run.

3.30 General Recreational Discard Mortality

As in SEDAR 28, discard mortalities δ were subjected to Monte Carlo variation as follows. A new value for general recreational discard mortality was drawn for each MCB trial from a truncated normal distribution range [0.10, 0.30] with mean equal to the point estimate ($\delta = 0.20$) and standard deviation set to provide 95% confidence limits at the bounds.

3.31 Projection Methods

Projections were run to predict stock status in years after the assessment, 2021–2025.

The structure of the projection model was the same as that of the assessment model, and parameter estimates were those from the assessment. A single selectivity curve was applied to calculate landings computed by averaging selectivities across fleets using geometric mean F s from the last three years of the assessment period, similar to computation of MSY benchmarks (§3.24).

3.31.1 Initialization of Projections

Although the terminal year of the assessment is 2020, the assessment model computes abundance at age (N_a) at the start of 2021. For projections, those estimates were used to initialize N_a . However, the assessment has no information to inform the strength of 2021 recruitment, and thus it computes 2021 recruits (N_1) as the expected value, that is, without deviation from the estimate of mean recruitment, and corrected to be unbiased in arithmetic space. In the stochastic projections, lognormal stochasticity was applied to these abundances after adjusting them to be unbiased in log space, with variability based on the estimate of σ_R . Thus, the initial abundance in year one (2021) of projections included this variability in N_1 . The deterministic projections were not adjusted in this manner, because deterministic recruitment follows mean recruitment.

Fishing rates that define the projections were assumed to start in 2023. Because the assessment period ended in 2020, the projections required an initialization period (2021 and 2022). L_{current} (the average landings over the last 3 years in the assessment model) was assumed during the interim period.

3.31.2 Uncertainty of Projections

To characterize uncertainty in future stock dynamics, stochasticity was included in replicate projections, each an extension of a single assessment fit from the ensemble. Thus, projections carried forward uncertainties in natural mortality and discard mortality, as well as in estimated quantities such as spawner-recruit parameters (R_0 and σ_R , selectivity curves, and in initial (start of 2021) abundance at age.

Initial and subsequent recruitment values were generated with stochasticity using a Monte Carlo procedure, in which the estimated recruitment of each model within the ensemble is used to compute mean annual recruitment values (\bar{R}_y). Variability is added to the mean values by choosing multiplicative deviations at random from a lognormal distribution,

$$R_y = \bar{R}_y \exp(\epsilon_y). \quad (3)$$

Here ϵ_y is drawn from a normal distribution with mean 0 and standard deviation σ_R , where σ_R is the standard deviation from the relevant ensemble model component.

The procedure generated 20,000 replicate projections of models within the ensemble drawn at random (with replacement). In cases where the same model run was drawn, projections would still differ as a result of stochasticity in projected recruitment streams. Central tendencies were represented by the deterministic projections of the base run, as well as by medians of the stochastic projections. Precision of projections was represented graphically by the 5th and 95th percentiles of the replicate projections.

3.31.3 Projection Scenarios

The ToRs for this assessment did not define projections scenarios. The SEDAR 78 panel defined three scenarios: F_{current} , F_{MSY} , and $75\%F_{\text{MSY}}$. In each, the landings in the interim period (2021–2022) were calculated based on F_{current} .

- Scenario 1: $F = F_{\text{current}}$, with L_{current} also assumed for the interim period.
- Scenario 2: $F = F_{\text{MSY}}$, with L_{current} assumed for the interim period.
- Scenario 3: $F = 75\%F_{\text{MSY}}$, with L_{current} assumed for the interim period.

4 Stock Assessment Results

4.1 Measures of Overall Model Fit

In general, the BAM fit well to the available data. Predicted age compositions were reasonably close to observed data in most years (Figures 2 and 3). The model was configured to fit observed commercial and general recreational removals closely (Figures 4–10). Fits to indices of abundance were reasonable, though the commercial handline index was generally underfit between 2004 and 2020 (Figures 11–13). There was no clear explanation for this trend and a sensitivity run to evaluate the exclusion of the commercial handline index is discussed in 4.11. The SEAMAP YOY index suggests highly variable recruitment from year to year; however, mismatches between trawl surveys and the timing of migration are an alternative explanation for the variability.

4.2 Parameter Estimates

Estimates of all parameters from the catch-age model are shown in Appendix B. Estimates of management quantities and some key parameters are reported in sections below.

4.3 Stock Abundance and Recruitment

Estimated abundance at age shows a similar pattern across all years with most variation in youngest ages (Figure 14). Annual number of recruits is shown in Table 9 (age-0 column) and in Figure 15.

4.4 Total and Spawning Biomass

Estimated biomass at age follows a similar pattern as did abundance (Table 10 and Figure 16). Total biomass and spawning biomass show nearly identical trends with near-decadal fluctuation in overall landings. The relative contribution and annual variability of YOY fish is lower in the biomass at age due to non-linear size at age.

4.5 Fishery Selectivity

Selectivities of landings from commercial and general recreational fleets are shown in Figures 17, 18, 19, 20, and 21. Selectivities of discards from commercial and general recreational fleets are shown in Figures 22 and 23. Selectivities are tabulated in Table 12. Estimated selectivities of removals indicate that full selection occurs by age one for commercial pound net and general recreational fleets and age three for commercial handline, cast net, and gillnet fleets. General recreational discards and shrimp bycatch were assumed to be mostly YOY (Figures 23 and 23).

Average selectivities of landings, dead discards, and the total weighted average of all selectivities were computed from F -weighted selectivities in the most recent three assessment years (Figure 24, Table 12). These average selectivities were used in computation of point estimates of benchmarks, as well as in projections.

4.6 Fishing Mortality

Estimates of total F by fleet are shown in Figure 25 and Table 13, and estimates of F at age are shown in Table 14. In any given year, the maximum F at age (i.e., apical F) may be less than that year's sum of fully selected F s across fleets. This inequality is due to the combination of two features of estimated selectivities: full selection occurs at different ages among gears and several sources of mortality have dome-shaped selectivity.

Alternative measures of fishing intensity have implications similar to those of apical F (Figure 26). The value of SPR_F has remained near or above the equilibrium MSY level with the exception of the terminal year which was dominated by removals from the general recreational fleet.

Throughout most of the assessment period, estimated landings and discard mortalities in number of fish have been split evenly between commercial and general recreational sectors (Figures 27 and 28). Early commercial landings were dominated by gillnet removals but shifted to a mix of cast net, gillnet, and handline starting in about 2004. Table 18 shows total landings at age in numbers, and Table 19 in 1000 lb. Table 20 shows total dead discards at age in thousand pounds, and Table 21 in weight.

4.7 Stock-Recruitment Parameters

The estimated Beverton–Holt spawner-recruit curve is shown in Figure 31. Variability about the curve was estimated only at relatively low levels of spawning biomass, because composition data required for estimating recruitment deviations became available only after spawning stock had been diminished. The effect of density dependence on recruitment can be examined graphically via the estimated recruits per spawner as a function of spawners (Figure 31).

The mean recruit relationship and variability around that mean are shown in Figure 31. Values of recruitment-related parameters were as follows: unfished YOY recruitment $\widehat{R}_0 = 21939130$, and standard deviation of recruitment residuals in log space was fixed at $\sigma_R = 0.6$ (which resulted in bias correction of $\zeta = 1.20$). Uncertainty in these quantities was estimated through the MCBE analysis (Figure 32).

4.8 Per Recruit and Equilibrium Analyses

Yield per recruit and spawning potential ratio were computed as functions of F . These computations applied the most recent selectivity patterns averaged across fleets, weighted by F from the last three years (2018–2020) (Figure 33).

As in per recruit analyses, equilibrium spawning biomass was computed as a function of F (Figure 34). Similarly, equilibrium biomass and removals are functions of F , allowing for their relationships to be depicted together (Figure 35).

4.9 Benchmarks / Reference Point

As described in §3.24, biological reference points (benchmarks) were derived analytically assuming equilibrium dynamics, corresponding to the estimated spawner-recruit curve with bias correction (Figure 31). This approach is consistent with methods used in rebuilding projections (i.e., fishing at F_{MSY} yields MSY from a stock size of SSB_{MSY}). $F_{\text{OY}} = 75\%F_{\text{MSY}}$ was considered as another possible values of F at optimum yield (OY). Standard errors of benchmarks were approximated as those from ensemble modeling §3.25.

Maximum likelihood estimates (base run) of benchmarks, as well as median values from MCBE analysis, are summarized in Table 22. Point estimates of MSY-related quantities were $F_{\text{MSY}} = 0.52$ (y^{-1}), $\text{MSY} = 8210.19$ (1000 lb), $B_{\text{MSY}} = 19588.3$ (mt), and $\text{SSB}_{\text{MSY}} = 6405.87$ (mature female biomass, mt). Median estimates were $F_{\text{MSY}} = 0.52$ (y^{-1}), $\text{MSY} = 8351.35$ (1000 lb), $B_{\text{MSY}} = 19820.72$ (mt), and $\text{SSB}_{\text{MSY}} = 6410.25$ (mature female biomass, mt). Distributions of these benchmarks from the MCBE analysis are shown in Figure 36.

4.10 Status of the Stock and Fishery

Estimated time series of stock status SSB/MSST showed a near-decadal fluctuation above MSST (Figure 37, Table 11). Base-run estimates of spawning biomass have remained above SSB_{MSY} . Current stock status was estimated in the base run to be $\text{SSB}_{2020}/\text{MSST} = 1.4$ and $\text{SSB}_{2020}/\text{SSB}_{\text{MSY}} = 1.05$ (Table 22), indicating that the stock is not overfished. Median values from the MCBE analysis indicated similar results $\text{SSB}/\text{MSST} = 1.42$ and $\text{SSB}/\text{SSB}_{\text{MSY}} = 1.07$ (Figure 37). The uncertainty analysis suggested that the terminal estimate of stock status is robust (Figures 38 and 40). Of the MCBE runs, 92.6% indicated that the stock was above MSST in 2020.

The estimated time series of F/F_{MSY} suggests that overfishing has not occurred throughout most of the assessment period except for 2020 (Table 11, Figure 37). Current fishery status in the terminal year, with current F represented by the geometric mean from years 2018–2020, was estimated by the base run to be $F/F_{\text{MSY}} = 0.77$ (Table 22). The fishery status was also robust (Figures 38 - 40). Of the MCBE runs, approximately 90% agreed with the base run that the stock is not currently experiencing overfishing.

Compared to SEDAR 28, the qualitative results of stock and fishery status are similar (Figure 41).

4.11 Sensitivities and Retrospective Runs

Sensitivity runs, described in §3.21, were used for exploring data or model issues that arose during the assessment process, for evaluating implications of assumptions in the base assessment model, and for interpreting MCBE results in terms of expected effects of input parameters. In some cases, sensitivity runs are simply a tool for better understanding model behavior, and therefore all runs are not considered equally plausible in the sense of alternative states of nature. Time series of F/F_{MSY} and $\text{SSB}/\text{SSB}_{\text{MSY}}$ are plotted to demonstrate sensitivity to the changing conditions in each run. This operational assessment explored sensitivity of the base run to changes in data input, natural mortality, steepness, and general recreational discard mortality (Figures 42–45). Of these modifications, results were most sensitive to the scale of natural mortality and steepness.

Retrospective analyses suggest no concerning patterns of estimating F or SSB in the terminal year (Figure 46) or status indicators (Figure 47). Terminal-year recruitment was variable across retrospective peels.

4.12 Projections

Since the stock status is not overfished or undergoing overfishing, three projections are provided for completeness and were recommended by the SEDAR 78 panel.

Projection scenario 1, which assumed L_{current} (average landings over the last 3 years) during the interim period (2021-2022) and $F = F_{\text{current}}$ for following years, predicted the stock to decrease until management measure take place and then increase back to SSB_{MSY} (Figure 48, Table 24).

Projection scenario 2, which assumed L_{current} (average landings over the last 3 years) during the interim period (2021-2022) and $F = F_{\text{msy}}$ for following years, predicted the stock to decrease until management measure take place and then increase but not recover to SSB_{MSY} in the terminal year (Figure 49, Table 25).

Projection scenario 3, which assumed L_{current} (average landings over the last 3 years) during the interim period (2021-2022) and $F = 75\%F_{\text{msy}}$, predicted the stock to decrease until management measure take place and then increase back to SSB_{MSY} (Figure 50, Table 26).

4.13 Discussion

The base run of the BAM indicated that the stock is not overfished $SSB/MSST = 1.4$, and that overfishing is not occurring based on the 3-year geometric mean $F/F_{\text{MSY}} = 0.77$. The 2020 point estimate for F/F_{MSY} indicated overfishing primarily due to a large increase in the general recreational landings during the COVID-19 pandemic. Should this high rate of fishing continue after 2020, overfishing would likely ensue. Indeed, preliminary MRIP estimates of Spanish mackerel landings in 2021 were higher than in 2020. The stock continues to show resilience to fishing effort as in SEDAR 28 (Figure 41). Neither of these models show a stock that was overfished or near overfishing in 2007 as SEDAR17 (2008) indicated.

The Monte Carlo/bootstrap ensemble analyses showed widespread agreement with the qualitative results of the base run. Of all MCBE runs, 92.6% showed that the stock is not overfished, and 90.0% showed that overfishing is not occurring.

4.13.1 Comments on the Assessment

In addition to including the more recent years of data, this operational assessment contained several modifications to the previous data of SEDAR 28, such as the use of modern MRIP methodology, the use of the Dirichlet–multinomial distribution to fit age compositions, pooling age compositions across years for fleets with low annual sample sizes, modification to selectivity functions applied to landings, update of the growth models and natural mortality, removing sex-specific growth and selectivity, and changing the start year of the model. The assessment model itself was also modernized to the current version of BAM. The sum of these improvements should result in a more robust assessment.

There is a lack of available fishery independent indices of abundance for this species. The schooling behavior of Spanish mackerel makes a random survey of their population particularly difficult. The one fishery independent index used (SEAMAP YOY) was highly variable, as would be expected for a recruitment index.

In general, fishery dependent indices of abundance may not track actual abundance well, because of factors such as hyperdepletion or hyperstability. Furthermore, this issue can be exacerbated by management measures. In this assessment, the commercial handline index was generated from Florida trip ticket data. There was a shift in the commercial handline index in 2004 after which a run of positive residuals persisted in the model fit. A sensitivity run excluding the commercial handline index did not influence the results in the terminal year of the assessment. The

index was included in the model but should be investigated further in future assessments. In general, management measures in the southeast U.S. have made the continued utility of fishery dependent indices questionable. This situation amplifies the importance of fishery independent sampling.

Natural mortality plays a driving role in this assessment, as it does in most. The pattern of natural mortality at age affects multiple outputs, including annual fishing rates, benchmarks, and equilibrium age structure expected at MSY. The model could estimate steepness at 0.73 but it was only weakly informed above 0.60 and would stay close to the starting value. As in SEDAR 28, steepness was fixed at 0.75 as a mid-point of the range over which no likelihood signal was available.

4.14 Comments on the Projections

As usual, projections should be interpreted in light of the model assumptions and key aspects of the data. Some major considerations are the following:

- In general, projections of fish stocks are highly uncertain, particularly in the long term (e.g., beyond 5–10 years).
- Although projections included many major sources of uncertainty, they did not include structural (model) uncertainty. That is, projection results are conditional on one set of functional forms used to describe population dynamics, selectivity, recruitment, etc.
- Fisheries were assumed to continue fishing at their estimated current proportions of total effort, using the estimated current selectivity patterns. New management regulations that alter those proportions or selectivities would likely affect projection results.
- The projections assumed that the estimated spawner-recruit relationship applies in the future and that past residuals represent future uncertainty in recruitment. If future recruitment is characterized by runs of large or small year classes, possibly due to environmental or ecological conditions, stock trajectories may be affected.

4.15 Research Recommendations

The research recommendations from the SEDAR 78 panel were as follows:

- Development of a fishery-independent survey for pelagic species would decrease reliance on a fishery-dependent index of abundance that has unexplained trends in residual values in recent years.
- Examine how schooling or migratory dynamics may influence the catchability of the species. In particular, research the assumption of the hyperstability of indices that sample the schooling portion of the stock.
- Age-dependent natural mortality was estimated by indirect methods (Lorenzen) for this assessment. Telemetry- and conventional-tagging programs can provide alternative estimates of natural mortality. Investigate new methods for determining point estimates for natural mortality.

4.16 Sampling Recommendations

- Limited information is available for shrimp bycatch in the Atlantic. Comprehensive observer coverage across space and time are needed to adequately capture the scale and size distribution of bycatch for Spanish mackerel and other species.
- The general recreational discards have increased dramatically in the last 2 years of this assessment. A better understanding of the size composition and mortality of discarded fish would improve the assessment, especially if discards continue to increase due to effort or future management changes.
- Implement systematic age sampling for the general recreational and commercial sectors. Age samples were important for this assessment for determining key parameters but sample sizes were limited, particularly for the general recreational sector, commercial handline and commercial cast net sectors, which account for the majority of the recent landings.

4.17 References

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4.18 Tables

Table 1. Size (FL) in inches and weight in pounds (lb) at age as applied to the population (Pop), female population (F), and fishery-dependent portion of the population (FD) with a 12-inch (FL) size limit, female maturity at age (Fem.mat), Lorenzen age-specific natural mortality (M) scaled to Hoenig point estimate of M.

Age	Pop.FL	Pop.lb	F.FL	F.lb	FD.FL	FD.lb	Fem.mat	M
0	10.32	0.38	11.10	0.46	12.72	0.68	0.00	0.68
1	16.00	1.31	17.07	1.58	15.24	1.14	0.94	0.46
2	19.12	2.18	20.28	2.58	17.30	1.64	1.00	0.40
3	20.84	2.78	22.01	3.25	19.00	2.14	1.00	0.37
4	21.78	3.16	22.94	3.66	20.39	2.62	1.00	0.36
5	22.30	3.38	23.44	3.89	21.53	3.06	1.00	0.35
6	22.58	3.50	23.71	4.02	22.47	3.45	1.00	0.34
7	22.74	3.57	23.85	4.09	23.25	3.80	1.00	0.34
8	22.83	3.61	23.93	4.13	23.88	4.10	1.00	0.34
9	22.88	3.63	23.97	4.15	24.40	4.36	1.00	0.34
10	22.90	3.64	23.99	4.16	24.83	4.58	1.00	0.34

Table 2. Observed time series of landings (L) and discards (D) for commercial handline (cH), commercial gill net (cG), commercial pound net(cP), commercial cast net(cC), shrimp bycatch (SB), and general recreational (GR) fisheries. Commercial landings are in units of 1000 lb whole weight; all others are in units of 1000 fish. Discards include all released fish, live or dead.

Year	L.cH	L.cG	L.cP	L.cC	L.GR	D.SB	D.GR
1986	78.442	4060.803	201.695	.	1758.446	293.467	99.901
1987	106.502	3616.669	470.433	.	1581.880	246.210	10.744
1988	64.864	3280.564	402.161	.	2748.961	295.158	26.275
1989	39.666	3180.917	509.040	.	2612.834	349.373	162.043
1990	111.857	2696.683	509.415	.	2607.275	270.381	164.992
1991	144.012	3798.801	468.247	.	3984.348	336.048	204.527
1992	50.239	2689.136	396.725	.	2627.843	253.739	141.393
1993	99.073	4415.277	328.326	.	1581.289	268.227	119.145
1994	58.246	3705.878	329.600	.	1871.097	300.299	235.680
1995	209.640	3236.730	199.030	15.419	1072.701	304.626	148.449
1996	139.445	2679.097	294.389	65.924	1403.063	247.772	225.914
1997	126.978	2674.398	207.188	210.195	1768.786	287.483	219.410
1998	149.026	2693.649	115.481	68.323	1567.478	259.449	99.250
1999	188.060	1887.672	271.264	66.391	2405.746	290.461	300.960
2000	311.524	1864.970	161.842	361.425	3124.254	270.720	369.641
2001	348.824	1705.127	196.164	892.775	2949.293	216.347	194.657
2002	438.663	1318.160	121.274	968.866	3360.141	237.459	360.647
2003	390.936	1092.515	90.685	1897.957	3324.354	184.847	503.116
2004	590.759	709.698	71.085	2242.104	1755.768	180.568	209.749
2005	841.431	1254.387	47.026	1574.132	2352.000	195.430	308.218
2006	707.656	1648.777	42.924	1524.472	1519.820	133.243	129.569
2007	775.882	1715.951	50.048	1268.365	2465.112	109.382	325.041
2008	869.796	1079.737	192.347	702.770	2648.595	118.257	451.296
2009	977.720	1439.248	363.026	966.518	3271.544	69.966	342.990
2010	1228.006	1346.147	144.150	1798.217	3704.510	112.672	457.321
2011	891.721	1084.574	87.480	1239.174	2770.439	116.988	294.592
2012	1118.972	1431.172	55.277	976.984	2072.331	132.276	239.588
2013	1359.102	1167.578	26.561	344.541	3902.423	94.578	544.831
2014	1748.908	941.229	33.890	562.620	2658.106	111.451	380.148
2015	1223.504	981.574	54.506	177.356	1496.388	126.194	213.302
2016	1401.609	1107.927	73.666	688.890	3447.737	125.049	426.454
2017	1379.049	1117.239	36.896	985.813	1786.717	113.893	298.662
2018	1600.541	1421.607	36.553	699.935	2472.430	89.469	628.452
2019	1382.207	1137.540	157.326	1234.201	4022.032	119.063	862.654
2020	1375.187	1569.859	82.623	666.309	6387.829	117.525	1058.072

Table 3. Observed indices of abundance and CVs from Florida commercial handline trip ticket (cH), MRIP general recreational (GR), and the SEAMAP YOY survey (YOY).

Year	cH	cH CV	GR	GR CV	YOY	YOY CV
1986	0.47	0.2	2.87	0.2	.	.
1987	0.60	0.2	1.18	0.2	.	.
1988	0.70	0.2	1.26	0.2	.	.
1989	0.65	0.2	1.39	0.2	1.16	0.26
1990	0.74	0.2	1.28	0.2	1.64	0.30
1991	0.53	0.2	1.11	0.2	2.21	0.34
1992	0.65	0.2	0.83	0.2	1.65	0.56
1993	1.01	0.2	0.64	0.2	0.79	0.12
1994	0.57	0.2	0.85	0.2	0.80	0.14
1995	0.83	0.2	0.59	0.2	1.36	0.22
1996	0.74	0.2	0.91	0.2	0.79	0.14
1997	0.67	0.2	1.11	0.2	0.36	0.12
1998	0.69	0.2	0.63	0.2	0.79	0.15
1999	0.78	0.2	1.19	0.2	0.86	0.18
2000	0.81	0.2	0.88	0.2	1.22	0.24
2001	0.82	0.2	0.94	0.2	1.89	0.52
2002	0.81	0.2	1.00	0.2	1.15	0.20
2003	0.96	0.2	0.94	0.2	0.72	0.16
2004	1.33	0.2	0.96	0.2	0.84	0.13
2005	1.29	0.2	0.82	0.2	1.00	0.17
2006	1.30	0.2	0.73	0.2	1.27	0.21
2007	1.14	0.2	0.73	0.2	1.32	0.19
2008	1.17	0.2	1.12	0.2	1.63	0.22
2009	1.44	0.2	0.94	0.2	1.18	0.23
2010	1.47	0.2	0.77	0.2	0.79	0.13
2011	1.33	0.2	0.90	0.2	0.40	0.09
2012	1.08	0.2	1.15	0.2	0.29	0.05
2013	1.11	0.2	1.07	0.2	0.82	0.17
2014	1.31	0.2	0.93	0.2	0.64	0.13
2015	1.18	0.2	0.74	0.2	0.46	0.09
2016	1.39	0.2	0.79	0.2	0.99	0.20
2017	1.34	0.2	0.75	0.2	0.96	0.26
2018	1.43	0.2	0.90	0.2	0.52	0.11
2019	1.42	0.2	1.18	0.2	0.45	0.10
2020	1.23	0.2	0.95	0.2	.	.

Table 4. Observed age composition from commercial handline (cH) pooled across all years. The year represents a mid-point of pooled years.

Year	trips	fish	0	1	2	3	4	5	6	7	8	9	10
2007	175	2953	0.0181	0.1384	0.2461	0.2452	0.1646	0.1044	0.0527	0.0207	0.0059	0.0028	0.0011

Table 5. Observed age composition from commercial gill net (cG).

Year	trips	fish	0	1	2	3	4	5	6	7	8	9	10
1992	13	190	0.0128	0.4021	0.3591	0.1109	0.0508	0.0325	0.0204	0.0114	0.0000	0.0000	0.0000
1993	14	150	0.0010	0.1735	0.3020	0.1930	0.1371	0.0538	0.0703	0.0547	0.0147	0.0000	0.0000
1995	11	167	0.0650	0.3532	0.2699	0.1830	0.0848	0.0115	0.0147	0.0097	0.0082	0.0000	0.0000
1996	14	414	0.0802	0.2440	0.3214	0.2718	0.0582	0.0175	0.0034	0.0026	0.0010	0.0000	0.0000
1997	15	246	0.0754	0.2728	0.3860	0.2043	0.0471	0.0035	0.0034	0.0054	0.0000	0.0021	0.0000
1998	24	363	0.2045	0.2007	0.3692	0.1440	0.0515	0.0186	0.0096	0.0020	0.0000	0.0000	0.0000
1999	20	447	0.0879	0.3803	0.1672	0.2052	0.0970	0.0447	0.0165	0.0011	0.0000	0.0000	0.0000
2000	40	588	0.0410	0.3292	0.3315	0.1125	0.1098	0.0364	0.0306	0.0078	0.0012	0.0000	0.0000
2001	37	315	0.2161	0.3698	0.2659	0.1095	0.0302	0.0017	0.0059	0.0000	0.0009	0.0000	0.0000
2002	19	365	0.1325	0.1256	0.2080	0.2478	0.1676	0.0970	0.0089	0.0025	0.0007	0.0095	0.0000
2003	24	365	0.0831	0.4116	0.1515	0.0827	0.1735	0.0701	0.0227	0.0017	0.0004	0.0020	0.0008
2004	30	551	0.0465	0.2861	0.3836	0.2146	0.0316	0.0228	0.0099	0.0038	0.0010	0.0000	0.0001
2005	10	249	0.1431	0.6156	0.1467	0.0678	0.0190	0.0013	0.0064	0.0000	0.0000	0.0000	0.0000
2006	20	355	0.0425	0.3598	0.3227	0.1607	0.0740	0.0273	0.0114	0.0000	0.0016	0.0000	0.0000
2007	18	234	0.2707	0.4321	0.1614	0.0560	0.0420	0.0131	0.0046	0.0118	0.0061	0.0018	0.0003
2008	32	288	0.0857	0.3605	0.2913	0.1273	0.0947	0.0326	0.0079	0.0000	0.0000	0.0000	0.0000
2009	37	348	0.0329	0.3710	0.2962	0.1922	0.0563	0.0418	0.0095	0.0000	0.0000	0.0000	0.0000
2010	42	287	0.1311	0.1857	0.2956	0.1987	0.1100	0.0657	0.0085	0.0046	0.0000	0.0000	0.0000
2011	34	389	0.0571	0.3634	0.2812	0.1821	0.0848	0.0248	0.0054	0.0011	0.0000	0.0000	0.0000
2012	16	208	0.0704	0.2532	0.3401	0.2302	0.0613	0.0343	0.0071	0.0034	0.0000	0.0000	0.0000
2013	15	201	0.2573	0.3884	0.1917	0.1131	0.0258	0.0237	0.0000	0.0000	0.0000	0.0000	0.0000
2014	21	203	0.0545	0.2984	0.3992	0.2028	0.0324	0.0127	0.0000	0.0000	0.0000	0.0000	0.0000
2015	21	205	0.2122	0.4356	0.2213	0.0902	0.0283	0.0119	0.0000	0.0000	0.0006	0.0000	0.0000
2016	14	228	0.0315	0.3419	0.4449	0.1122	0.0560	0.0127	0.0008	0.0000	0.0000	0.0000	0.0000
2017	14	136	0.0000	0.2247	0.5287	0.1525	0.0869	0.0072	0.0000	0.0000	0.0000	0.0000	0.0000
2018	13	31	0.0000	0.2352	0.5788	0.1767	0.0082	0.0011	0.0000	0.0000	0.0000	0.0000	0.0000
2019	19	30	0.0000	0.4373	0.4378	0.0759	0.0422	0.0000	0.0028	0.0040	0.0000	0.0000	0.0000
2020	19	68	0.0068	0.2654	0.5239	0.1383	0.0316	0.0316	0.0023	0.0000	0.0000	0.0000	0.0000

Table 6. Observed age composition from commercial pound net (cP).

Year	trips	fish	0	1	2	3	4	5	6	7	8	9	10
2002	57	773	0.0181	0.5925	0.0660	0.1837	0.0931	0.0323	0.0013	0.0065	0.0026	0.0039	0.000
2003	22	329	0.0000	0.7690	0.0729	0.0122	0.1155	0.0213	0.0061	0.0000	0.0000	0.0000	0.003
2004	18	400	0.0000	0.4775	0.3450	0.0950	0.0100	0.0600	0.0100	0.0000	0.0000	0.0025	0.000
2005	14	341	0.0235	0.7713	0.0850	0.0880	0.0147	0.0029	0.0059	0.0088	0.0000	0.0000	0.000
2006	20	286	0.0000	0.4930	0.3566	0.0839	0.0385	0.0105	0.0070	0.0000	0.0105	0.0000	0.000
2007	18	226	0.1858	0.6018	0.1283	0.0664	0.0000	0.0133	0.0044	0.0000	0.0000	0.0000	0.000
2008	13	110	0.1091	0.5091	0.2364	0.0636	0.0364	0.0091	0.0182	0.0000	0.0000	0.0182	0.000
2009	16	98	0.1020	0.5000	0.3367	0.0204	0.0204	0.0102	0.0000	0.0102	0.0000	0.0000	0.000
2010	25	187	0.0000	0.6257	0.2727	0.0856	0.0000	0.0107	0.0000	0.0000	0.0053	0.0000	0.000
2011	19	210	0.0000	0.4667	0.2048	0.1762	0.0857	0.0429	0.0048	0.0143	0.0000	0.0048	0.000
2012	17	166	0.0000	0.5301	0.3373	0.0602	0.0482	0.0241	0.0000	0.0000	0.0000	0.0000	0.000
2013	10	42	0.2619	0.5238	0.1429	0.0476	0.0000	0.0238	0.0000	0.0000	0.0000	0.0000	0.000
2014	19	172	0.0058	0.6512	0.2500	0.0581	0.0233	0.0058	0.0058	0.0000	0.0000	0.0000	0.000
2015	19	186	0.0000	0.6774	0.2366	0.0591	0.0108	0.0161	0.0000	0.0000	0.0000	0.0000	0.000
2016	22	175	0.0000	0.6514	0.2000	0.1086	0.0286	0.0057	0.0057	0.0000	0.0000	0.0000	0.000
2017	22	193	0.0000	0.4249	0.4715	0.0777	0.0104	0.0104	0.0000	0.0052	0.0000	0.0000	0.000
2018	18	111	0.0000	0.5225	0.2072	0.1892	0.0360	0.0180	0.0000	0.0270	0.0000	0.0000	0.000
2019	27	134	0.0000	0.5448	0.2090	0.1119	0.0896	0.0373	0.0075	0.0000	0.0000	0.0000	0.000
2020	15	78	0.1282	0.3205	0.4359	0.0641	0.0513	0.0000	0.0000	0.0000	0.0000	0.0000	0.000

Table 7. Observed age composition from commercial cast net (cC) pooled across all years. The year represents a mid-point of pooled years.

Year	trips	fish	0	1	2	3	4	5	6	7	8	9	10
2010	74	2215	0.0013	0.0453	0.2763	0.2504	0.2277	0.1165	0.048	0.0214	0.0081	0.0039	0.0012

Table 8. Observed age composition from the general recreational fishery (GR).

Year	trips	fish	0	1	2	3	4	5	6	7	8	9	10
1990	38	262	0.0649	0.4618	0.2672	0.1031	0.0191	0.0496	0.0191	0.0038	0.0038	0.0000	0.0076
1991	19	342	0.0468	0.5029	0.1901	0.1111	0.0614	0.0468	0.0292	0.0117	0.0000	0.0000	0.0000
1992	36	240	0.0083	0.4625	0.2000	0.1000	0.1125	0.0333	0.0375	0.0333	0.0125	0.0000	0.0000
1993	21	113	0.0354	0.4248	0.1150	0.0885	0.1327	0.0885	0.0354	0.0531	0.0088	0.0088	0.0088
1997	17	316	0.1392	0.6139	0.1930	0.0316	0.0063	0.0095	0.0063	0.0000	0.0000	0.0000	0.0000
1998	23	222	0.1171	0.4009	0.2658	0.1081	0.0631	0.0045	0.0045	0.0225	0.0090	0.0000	0.0045
1999	10	101	0.0198	0.7921	0.0297	0.0495	0.0297	0.0396	0.0297	0.0099	0.0000	0.0000	0.0000
2000	15	130	0.0000	0.3077	0.1538	0.0692	0.1769	0.1385	0.0923	0.0385	0.0077	0.0077	0.0077
2002	17	205	0.0683	0.4537	0.1610	0.1220	0.0976	0.0244	0.0146	0.0146	0.0293	0.0098	0.0049
2003	10	321	0.2399	0.6604	0.0748	0.0125	0.0062	0.0031	0.0000	0.0031	0.0000	0.0000	0.0000
2004	13	241	0.1037	0.6598	0.0996	0.0747	0.0373	0.0166	0.0041	0.0000	0.0000	0.0041	0.0000
2005	17	208	0.0144	0.9135	0.0240	0.0240	0.0144	0.0000	0.0048	0.0048	0.0000	0.0000	0.0000
2006	15	232	0.1121	0.7716	0.0388	0.0302	0.0302	0.0086	0.0043	0.0043	0.0000	0.0000	0.0000
2007	10	177	0.1921	0.7288	0.0508	0.0113	0.0000	0.0113	0.0000	0.0056	0.0000	0.0000	0.0000
2008	14	204	0.0980	0.7745	0.0784	0.0343	0.0147	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2010	12	295	0.0949	0.4373	0.2814	0.1017	0.0576	0.0203	0.0068	0.0000	0.0000	0.0000	0.0000
2011	13	348	0.1810	0.4971	0.1236	0.0805	0.0776	0.0230	0.0115	0.0029	0.0000	0.0000	0.0029
2012	31	489	0.0900	0.5460	0.2740	0.0286	0.0348	0.0123	0.0082	0.0061	0.0000	0.0000	0.0000
2013	29	328	0.0732	0.6890	0.1067	0.0671	0.0152	0.0122	0.0213	0.0152	0.0000	0.0000	0.0000
2014	47	494	0.0567	0.7024	0.0911	0.0547	0.0486	0.0162	0.0202	0.0020	0.0020	0.0020	0.0040
2015	38	358	0.2207	0.5810	0.1034	0.0363	0.0307	0.0084	0.0112	0.0028	0.0000	0.0028	0.0028
2016	40	525	0.1314	0.6724	0.0686	0.0324	0.0381	0.0286	0.0114	0.0095	0.0038	0.0019	0.0019
2017	32	331	0.0211	0.6798	0.2236	0.0453	0.0121	0.0060	0.0030	0.0060	0.0000	0.0000	0.0030
2018	58	392	0.0842	0.5051	0.1837	0.1378	0.0485	0.0306	0.0026	0.0026	0.0026	0.0026	0.0000
2019	64	401	0.0574	0.5661	0.1995	0.0898	0.0499	0.0150	0.0125	0.0075	0.0025	0.0000	0.0000
2020	50	250	0.0840	0.3800	0.1920	0.1080	0.1080	0.0600	0.0560	0.0080	0.0000	0.0000	0.0040

Table 9. Estimated total abundance at age (1000 fish) at start of year.

Year	0	1	2	3	4	5	6	7	8	9	10	Total
1986	17618.83	17806.94	3265.86	954.79	443.13	188.63	97.08	46.56	24.18	13.47	20.41	40479.87
1987	20083.54	8476.48	8599.45	1486.15	446.14	216.25	97.19	53.15	27.15	14.87	22.08	39522.45
1988	25256.30	9795.56	4207.35	4166.42	741.17	231.02	117.10	55.24	31.77	16.94	24.18	44643.04
1989	21747.10	12252.55	4548.99	1925.75	1967.24	363.78	118.72	63.25	31.44	18.93	25.86	43063.61
1990	21651.04	10445.38	5811.81	2144.68	936.42	992.88	191.81	65.61	36.71	19.05	28.52	42323.91
1991	18150.83	10460.30	5023.22	2817.86	1073.26	485.07	535.00	107.74	38.50	22.38	30.37	38744.53
1992	12465.06	8542.81	4333.16	2035.03	1179.72	470.21	224.63	263.45	56.60	21.43	31.48	29623.57
1993	18757.29	5906.23	3843.93	1942.30	941.92	567.93	237.14	119.14	147.33	33.17	32.82	32529.19
1994	18054.48	8929.19	2591.13	1548.96	804.43	410.87	264.80	119.28	64.85	85.81	41.25	32915.04
1995	18466.48	8511.74	3895.83	1055.08	648.84	354.29	192.87	133.61	64.88	37.64	78.49	33439.75
1996	20406.68	8856.09	4184.07	1827.38	507.86	325.38	186.90	107.62	79.02	40.31	76.22	36597.55
1997	13115.41	9834.42	4406.09	2047.73	916.99	264.09	176.55	106.16	64.11	49.03	75.77	31056.36
1998	25154.19	6214.76	4838.07	2145.00	1015.15	470.15	141.02	98.46	61.96	38.91	79.23	40256.90
1999	23951.30	12246.48	3106.71	2390.27	1087.41	532.42	256.64	80.34	58.66	38.35	76.53	43825.10
2000	14472.77	11550.40	6098.91	1581.65	1251.70	586.79	297.04	148.15	48.07	36.22	73.83	36145.53
2001	19374.13	6820.91	5553.03	3003.40	791.60	644.63	312.34	163.55	84.56	28.33	67.68	36844.16
2002	24012.75	9325.15	3195.47	2603.72	1402.55	379.99	320.31	160.85	87.50	46.81	55.74	41590.85
2003	15588.61	11494.24	4289.28	1475.00	1188.77	657.33	184.16	160.69	83.73	47.11	57.70	35226.61
2004	21462.74	7336.93	5372.95	1949.32	626.90	514.36	293.11	84.68	76.36	41.01	53.41	37811.77
2005	17178.74	10486.18	3856.97	2711.13	902.60	293.18	245.76	142.91	42.19	38.77	49.13	35947.55
2006	20860.77	8258.29	5268.46	1896.18	1270.28	430.61	143.77	123.89	74.19	22.47	48.38	38397.29
2007	26847.99	10254.57	4368.41	2694.79	927.88	633.07	220.59	75.72	67.18	41.24	40.62	46172.05
2008	23288.67	13084.20	5145.57	2152.38	1291.72	454.67	319.76	114.92	40.76	37.21	46.91	45976.78
2009	16683.91	11297.23	6757.72	2732.86	1145.03	701.92	253.15	182.20	67.11	24.32	51.63	39897.08
2010	19439.88	8061.20	5527.51	3363.75	1355.64	581.76	367.13	136.28	101.14	38.30	45.04	39017.62
2011	15155.47	9259.57	3681.57	2507.15	1474.44	607.93	269.41	175.71	67.57	51.81	44.57	33295.21
2012	13391.82	7288.22	4499.97	1798.63	1199.79	720.97	305.80	139.39	93.69	37.03	54.64	29529.95
2013	19195.66	6437.72	3621.22	2233.81	880.72	601.41	372.46	162.88	76.70	53.05	53.82	33689.46
2014	17716.95	8996.48	2633.52	1526.84	959.82	391.39	278.13	179.63	82.20	40.39	59.57	32864.93
2015	25749.22	8483.57	4251.31	1266.92	734.09	473.34	199.06	145.94	97.46	45.98	58.26	41505.15
2016	20926.00	12672.48	4557.95	2362.00	718.56	425.93	281.25	120.97	90.81	61.90	67.86	42285.71
2017	20518.31	10070.78	6139.85	2258.58	1170.04	364.51	222.28	150.96	66.92	51.63	76.44	41090.30
2018	25671.96	10032.73	5444.50	3371.52	1226.95	647.21	206.07	128.23	88.97	40.17	78.67	46936.99
2019	15643.59	12376.35	5182.47	2892.64	1802.07	670.58	362.80	118.38	75.61	53.67	73.90	39252.04
2020	18460.13	7228.16	5793.22	2506.16	1384.45	882.46	337.87	188.04	63.25	41.54	72.84	36958.11
2021	23015.23	8203.22	2486.24	2061.07	902.47	518.67	347.31	140.28	82.74	29.43	57.80	37844.45

Table 10. Estimated biomass at age (1000 lb) at start of year.

Year	0	1	2	3	4	5	6	7	8	9	10	Total
1986	6648.5	23377.6	7119.4	2658.1	1399.5	636.9	340.0	166.2	87.3	48.9	74.3	42556.9
1987	7578.6	11128.3	18746.6	4137.6	1409.0	730.2	340.4	189.8	98.1	54.0	80.5	44492.6
1988	9530.6	12860.0	9171.9	11599.6	2340.6	780.2	410.1	197.3	114.6	61.5	88.2	47154.5
1989	8206.3	16085.6	9916.6	5361.4	6212.8	1228.4	415.8	226.0	113.5	68.8	94.1	47929.2
1990	8170.1	13713.0	12669.5	5971.0	2957.3	3353.0	671.5	234.4	132.5	69.2	103.8	48045.3
1991	6849.3	13732.6	10950.4	7845.1	3389.4	1638.0	1873.3	384.7	138.9	81.4	110.7	46994.0
1992	4703.8	11215.4	9446.1	5665.7	3725.6	1588.0	786.6	940.7	204.4	77.8	114.6	38468.5
1993	7078.2	7753.9	8379.6	5407.5	2974.7	1917.8	830.3	425.5	531.8	120.4	119.5	35539.4
1994	6812.9	11722.4	5648.5	4312.5	2540.4	1387.6	927.3	425.9	234.1	311.5	150.4	34473.5
1995	6968.4	11174.6	8492.9	2937.4	2049.2	1196.4	675.3	477.1	234.1	136.7	285.9	34627.8
1996	7700.5	11626.5	9121.2	5087.6	1603.9	1098.8	654.3	384.3	285.3	146.4	277.8	37986.5
1997	4949.2	12910.9	9605.1	5701.2	2896.0	891.8	618.2	379.2	231.5	178.1	276.0	38636.9
1998	9492.0	8158.9	10546.7	5971.9	3206.0	1587.8	493.8	351.6	223.8	141.3	288.6	40462.3
1999	9038.1	16077.7	6772.6	6654.7	3434.1	1798.1	898.6	286.8	211.6	139.3	278.9	45590.3
2000	5461.3	15163.8	13295.4	4403.5	3953.1	1981.5	1040.1	529.1	173.5	131.6	269.0	46401.6
2001	7311.0	8954.7	12105.4	8361.7	2500.0	2176.8	1093.7	584.0	305.3	103.0	246.5	43741.9
2002	9061.2	12242.3	6965.9	7249.0	4429.3	1283.3	1121.5	574.5	315.9	170.0	203.0	43616.0
2003	5882.4	15090.0	9350.5	4106.6	3754.3	2219.8	644.9	573.9	302.3	171.1	210.3	42305.6
2004	8099.1	9632.2	11712.7	5427.1	1979.8	1737.0	1026.3	302.5	275.6	148.8	194.7	40535.7
2005	6482.5	13766.5	8408.0	7548.0	2850.6	990.1	860.5	510.4	152.3	140.9	179.0	41888.5
2006	7871.8	10841.7	11485.0	5279.2	4011.8	1454.2	503.3	442.5	267.9	81.6	176.1	42415.2
2007	10131.1	13462.5	9522.9	7502.6	2930.4	2137.8	772.3	270.5	242.5	149.7	147.9	47270.4
2008	8788.1	17177.3	11217.1	5992.4	4079.4	1535.5	1119.5	410.3	147.0	135.1	170.9	50772.9
2009	6295.7	14831.4	14731.5	7608.6	3616.2	2370.4	886.5	650.6	242.3	88.4	188.1	51509.5
2010	7335.7	10583.1	12049.8	9365.0	4281.4	1964.5	1285.5	486.8	365.1	139.1	164.0	48019.8
2011	5719.0	12156.3	8025.7	6980.1	4656.4	2052.9	943.4	627.4	243.8	188.1	162.5	41755.8
2012	5053.4	9568.3	9809.7	5007.6	3789.1	2434.8	1070.8	497.8	338.2	134.5	199.1	37903.0
2013	7243.5	8451.6	7894.1	6219.0	2781.4	2030.9	1304.3	581.6	276.9	192.7	196.0	37172.1
2014	6685.5	11810.8	5741.1	4250.7	3031.1	1321.7	973.8	641.5	296.7	146.6	216.9	35117.0
2015	9716.7	11137.5	9267.8	3527.2	2318.4	1598.6	697.1	521.2	351.9	166.9	212.3	39515.0
2016	7896.5	16636.7	9936.2	6575.9	2269.2	1438.3	984.8	431.9	327.8	224.7	247.1	46969.7
2017	7742.6	13221.1	13384.7	6288.0	3695.2	1231.1	778.2	539.0	241.6	187.4	278.4	47587.7
2018	9687.3	13171.3	11868.8	9386.6	3874.8	2185.7	721.6	457.9	321.2	145.9	286.6	52107.6
2019	5903.1	16248.1	11297.6	8053.3	5691.2	2264.6	1270.3	422.8	272.9	194.9	269.2	51887.8
2020	6965.9	9489.4	12629.0	6977.4	4372.2	2980.0	1183.0	671.5	228.4	150.8	265.4	45913.0
2021	8684.9	10769.4	5419.8	5738.2	2850.1	1751.6	1216.1	500.9	298.7	106.9	210.5	37547.1

Table 11. Estimated time series and status indicators. Fishing mortality rate is full F , which includes discard mortalities. Total biomass (B , mt) is at the start of the year, and spawning biomass (SSB , mt) at the end of July (time of peak spawning). The MSST is defined by $MSST = 75\%SSB_{MSY}$. SPR is static spawning potential ratio.

Year	F	F/F_{MSY}	B	$B/B_{unfished}$	SSB	SSB/SSB_{MSY}	$SSB/MSST$	SPR
1986	0.393	0.761	19303	0.334	6448	1.007	1.34	0.415
1987	0.328	0.635	20182	0.349	7259	1.133	1.51	0.461
1988	0.385	0.745	21389	0.370	7212	1.126	1.50	0.407
1989	0.355	0.688	21740	0.376	7683	1.199	1.60	0.423
1990	0.327	0.633	21793	0.377	7811	1.219	1.63	0.444
1991	0.507	0.982	21316	0.369	7352	1.148	1.53	0.324
1992	0.405	0.786	17449	0.302	6431	1.004	1.34	0.380
1993	0.513	0.995	16120	0.279	5270	0.823	1.10	0.341
1994	0.502	0.973	15637	0.271	5117	0.799	1.07	0.339
1995	0.363	0.704	15707	0.272	5389	0.841	1.12	0.433
1996	0.322	0.623	17230	0.298	5968	0.932	1.24	0.460
1997	0.334	0.647	17525	0.303	6606	1.031	1.38	0.442
1998	0.311	0.603	18353	0.318	6151	0.960	1.28	0.471
1999	0.279	0.540	20679	0.358	7248	1.131	1.51	0.481
2000	0.324	0.628	21047	0.364	8022	1.252	1.67	0.434
2001	0.393	0.762	19841	0.343	7033	1.098	1.46	0.405
2002	0.416	0.806	19784	0.342	6580	1.027	1.37	0.389
2003	0.488	0.945	19190	0.332	6860	1.071	1.43	0.371
2004	0.405	0.785	18387	0.318	6387	0.997	1.33	0.461
2005	0.390	0.756	19000	0.329	6892	1.076	1.43	0.437
2006	0.347	0.672	19239	0.333	6874	1.073	1.43	0.488
2007	0.367	0.712	21441	0.371	7265	1.134	1.51	0.450
2008	0.263	0.510	23030	0.399	8433	1.316	1.76	0.511
2009	0.333	0.645	23364	0.404	8891	1.388	1.85	0.449
2010	0.457	0.885	21781	0.377	7695	1.201	1.60	0.374
2011	0.369	0.715	18940	0.328	7010	1.094	1.46	0.430
2012	0.346	0.671	17193	0.298	6468	1.010	1.35	0.448
2013	0.477	0.924	16861	0.292	5535	0.864	1.15	0.326
2014	0.364	0.706	15929	0.276	5494	0.858	1.14	0.417
2015	0.199	0.386	17924	0.310	6126	0.956	1.28	0.584
2016	0.334	0.648	21305	0.369	7630	1.191	1.59	0.442
2017	0.242	0.469	21585	0.374	8147	1.272	1.70	0.553
2018	0.258	0.501	23636	0.409	8571	1.338	1.78	0.511
2019	0.369	0.715	23536	0.407	8887	1.387	1.85	0.399
2020	0.653	1.266	20826	0.360	6725	1.050	1.40	0.241
2021	.	.	17031	0.295

Table 12. Selectivity at age (end-of-assessment time period) for commercial handline (cH), commercial pound net (cP), commercial gill net (cG), commercial cast net (cC), and general recreational (GR) landings. Selectivity at age for general recreational discards (GR.D), shrimp bycatch discards (SB.D), and selectivity of landings averaged across fisheries (L.avg), discards averaged across fisheries (D.avg) and catches across fisheries (tot.avg).

Age	FL(mm)	cH	cP	cG	cC	GR	GR.D	SB.D	L.avg	D.avg	tot.avg
0	262.2	0.012	0.027	0.068	0.002	0.084	1.000	1.0	0.059	0.121	0.179
1	406.4	0.076	1.000	0.510	0.037	1.000	0.375	0.2	0.642	0.043	0.685
2	485.6	0.356	0.980	0.980	0.440	0.992	0.000	0.0	0.826	0.000	0.826
3	529.2	0.787	0.921	1.000	0.942	0.967	0.000	0.0	0.986	0.000	0.986
4	553.2	0.961	0.830	0.911	0.997	0.927	0.000	0.0	1.000	0.000	1.000
5	566.4	0.994	0.719	0.771	1.000	0.873	0.000	0.0	0.959	0.000	0.959
6	573.6	0.999	0.597	0.595	1.000	0.809	0.000	0.0	0.899	0.000	0.899
7	577.6	1.000	0.476	0.414	1.000	0.737	0.000	0.0	0.833	0.000	0.833
8	579.8	1.000	0.364	0.262	1.000	0.660	0.000	0.0	0.769	0.000	0.769
9	581.0	1.000	0.267	0.153	1.000	0.581	0.000	0.0	0.710	0.000	0.710
10	581.7	1.000	0.188	0.085	1.000	0.503	0.000	0.0	0.658	0.000	0.658

Table 13. Estimated time series of fully selected fishing mortality rates for commercial handline (F.cH), commercial pound net (F.cP), commercial gill net (F.cG), commercial cast net (F.cC), general recreational (F.GR), general recreational discards(F.GR.D), and shrimp bycatch (F.SB.D). Also shown is apical F (Full.F), the maximum F at age summed across fleets. Full F may not equal the sum of fully selected F's because of dome-shaped selectivities.

Year	F.cH	F.cP	F.cG	F.cC	F.GR	F.GR.D	F.SB.D	Full.F
1986	0.014	0.010	0.284	0.000	0.103	0.006	0.020	0.393
1987	0.013	0.023	0.204	0.000	0.106	0.001	0.016	0.328
1988	0.007	0.020	0.185	0.000	0.185	0.001	0.015	0.385
1989	0.004	0.023	0.175	0.000	0.162	0.009	0.020	0.355
1990	0.010	0.023	0.143	0.000	0.165	0.009	0.016	0.327
1991	0.014	0.023	0.217	0.000	0.274	0.013	0.024	0.507
1992	0.005	0.022	0.177	0.000	0.212	0.013	0.025	0.405
1993	0.012	0.023	0.342	0.000	0.156	0.008	0.019	0.513
1994	0.008	0.023	0.316	0.000	0.171	0.016	0.022	0.502
1995	0.030	0.013	0.260	0.002	0.093	0.010	0.021	0.363
1996	0.018	0.017	0.191	0.008	0.111	0.013	0.016	0.322
1997	0.015	0.011	0.175	0.023	0.132	0.018	0.027	0.334
1998	0.016	0.007	0.174	0.007	0.129	0.005	0.014	0.311
1999	0.019	0.013	0.112	0.006	0.154	0.015	0.015	0.279
2000	0.029	0.007	0.100	0.032	0.194	0.028	0.023	0.324
2001	0.032	0.010	0.098	0.074	0.224	0.013	0.015	0.393
2002	0.043	0.007	0.083	0.090	0.251	0.019	0.013	0.416
2003	0.043	0.005	0.070	0.201	0.232	0.036	0.015	0.488
2004	0.067	0.004	0.046	0.234	0.136	0.012	0.011	0.405
2005	0.091	0.002	0.078	0.159	0.166	0.021	0.014	0.390
2006	0.073	0.002	0.099	0.148	0.110	0.008	0.008	0.347
2007	0.076	0.002	0.098	0.117	0.162	0.015	0.005	0.367
2008	0.079	0.008	0.055	0.061	0.149	0.022	0.006	0.263
2009	0.080	0.015	0.068	0.073	0.189	0.023	0.005	0.333
2010	0.101	0.007	0.071	0.137	0.259	0.029	0.008	0.457
2011	0.082	0.004	0.065	0.107	0.206	0.022	0.010	0.369
2012	0.110	0.003	0.092	0.090	0.172	0.021	0.013	0.346
2013	0.148	0.002	0.086	0.035	0.368	0.036	0.007	0.477
2014	0.219	0.002	0.074	0.068	0.232	0.025	0.008	0.364
2015	0.145	0.003	0.067	0.020	0.114	0.010	0.006	0.199
2016	0.144	0.003	0.063	0.067	0.212	0.023	0.008	0.334
2017	0.124	0.002	0.057	0.083	0.109	0.017	0.007	0.242
2018	0.125	0.002	0.068	0.051	0.146	0.030	0.005	0.258
2019	0.106	0.006	0.054	0.089	0.233	0.061	0.009	0.369
2020	0.125	0.005	0.095	0.056	0.519	0.074	0.009	0.653

Table 14. Spanish mackerel: Estimated instantaneous fishing mortality rate (per yr) at age, including discard mortality

Year	0	1	2	3	4	5	6	7	8	9	10
1986	0.054	0.264	0.390	0.393	0.362	0.316	0.258	0.198	0.146	0.106	0.078
1987	0.040	0.236	0.328	0.328	0.303	0.266	0.221	0.174	0.132	0.099	0.075
1988	0.045	0.303	0.385	0.382	0.357	0.319	0.272	0.223	0.178	0.141	0.113
1989	0.055	0.282	0.355	0.353	0.329	0.293	0.249	0.203	0.161	0.127	0.101
1990	0.049	0.268	0.327	0.324	0.303	0.271	0.233	0.192	0.155	0.124	0.100
1991	0.076	0.417	0.507	0.503	0.470	0.423	0.364	0.303	0.246	0.199	0.161
1992	0.069	0.335	0.405	0.402	0.376	0.338	0.290	0.240	0.194	0.156	0.126
1993	0.064	0.360	0.512	0.513	0.475	0.416	0.343	0.267	0.201	0.149	0.112
1994	0.074	0.365	0.501	0.502	0.465	0.409	0.340	0.268	0.204	0.154	0.117
1995	0.057	0.246	0.360	0.363	0.335	0.293	0.239	0.184	0.136	0.099	0.073
1996	0.052	0.234	0.318	0.322	0.299	0.264	0.222	0.177	0.137	0.106	0.083
1997	0.069	0.245	0.323	0.334	0.313	0.280	0.240	0.197	0.159	0.129	0.106
1998	0.042	0.229	0.308	0.311	0.290	0.258	0.219	0.177	0.140	0.110	0.088
1999	0.051	0.233	0.278	0.279	0.262	0.237	0.205	0.172	0.142	0.117	0.096
2000	0.074	0.268	0.311	0.324	0.309	0.284	0.253	0.220	0.189	0.162	0.140
2001	0.053	0.294	0.360	0.393	0.379	0.352	0.320	0.285	0.251	0.222	0.197
2002	0.059	0.313	0.376	0.416	0.403	0.377	0.346	0.312	0.279	0.250	0.224
2003	0.076	0.296	0.392	0.488	0.483	0.461	0.433	0.403	0.374	0.348	0.324
2004	0.038	0.179	0.287	0.402	0.405	0.392	0.374	0.356	0.338	0.322	0.308
2005	0.054	0.224	0.313	0.390	0.385	0.366	0.341	0.315	0.290	0.268	0.250
2006	0.032	0.173	0.273	0.347	0.341	0.322	0.297	0.271	0.247	0.228	0.212
2007	0.041	0.226	0.311	0.367	0.358	0.336	0.308	0.278	0.251	0.227	0.208
2008	0.045	0.197	0.236	0.263	0.255	0.239	0.218	0.197	0.176	0.158	0.142
2009	0.049	0.251	0.301	0.333	0.322	0.301	0.275	0.248	0.221	0.197	0.177
2010	0.064	0.320	0.394	0.457	0.447	0.423	0.393	0.360	0.329	0.300	0.275
2011	0.054	0.258	0.319	0.369	0.360	0.340	0.315	0.288	0.262	0.238	0.217
2012	0.054	0.235	0.303	0.346	0.336	0.313	0.286	0.256	0.229	0.205	0.185
2013	0.080	0.430	0.467	0.477	0.456	0.424	0.385	0.343	0.301	0.263	0.228
2014	0.058	0.286	0.335	0.364	0.352	0.329	0.301	0.270	0.241	0.214	0.191
2015	0.031	0.157	0.191	0.199	0.189	0.174	0.154	0.133	0.114	0.097	0.084
2016	0.053	0.261	0.305	0.334	0.324	0.303	0.278	0.251	0.225	0.201	0.180
2017	0.037	0.151	0.202	0.242	0.237	0.223	0.206	0.188	0.170	0.155	0.143
2018	0.052	0.197	0.235	0.258	0.249	0.232	0.210	0.187	0.166	0.146	0.130
2019	0.094	0.295	0.330	0.369	0.359	0.338	0.313	0.286	0.259	0.234	0.212
2020	0.133	0.603	0.636	0.653	0.627	0.586	0.535	0.480	0.425	0.373	0.326

Table 15. Estimated instantaneous total mortality rate (per yr) at age, including discard mortality.

Year	0	1	2	3	4	5	6	7	8	9	10
1986	0.732	0.728	0.787	0.761	0.717	0.663	0.602	0.539	0.486	0.446	0.417
1987	0.718	0.700	0.725	0.696	0.658	0.613	0.565	0.515	0.472	0.439	0.414
1988	0.723	0.767	0.782	0.750	0.712	0.666	0.616	0.564	0.518	0.481	0.452
1989	0.733	0.746	0.752	0.721	0.684	0.640	0.593	0.544	0.501	0.467	0.440
1990	0.727	0.732	0.724	0.692	0.658	0.618	0.577	0.533	0.495	0.464	0.439
1991	0.754	0.881	0.904	0.871	0.825	0.770	0.708	0.644	0.586	0.539	0.500
1992	0.747	0.799	0.802	0.770	0.731	0.685	0.634	0.581	0.534	0.496	0.465
1993	0.742	0.824	0.909	0.881	0.830	0.763	0.687	0.608	0.541	0.489	0.451
1994	0.752	0.829	0.898	0.870	0.820	0.756	0.684	0.609	0.544	0.494	0.456
1995	0.735	0.710	0.757	0.731	0.690	0.640	0.583	0.525	0.476	0.439	0.412
1996	0.730	0.698	0.715	0.690	0.654	0.611	0.566	0.518	0.477	0.446	0.422
1997	0.747	0.709	0.720	0.702	0.668	0.627	0.584	0.538	0.499	0.469	0.445
1998	0.720	0.693	0.705	0.679	0.645	0.605	0.563	0.518	0.480	0.450	0.427
1999	0.729	0.697	0.675	0.647	0.617	0.584	0.549	0.513	0.482	0.457	0.435
2000	0.752	0.732	0.708	0.692	0.664	0.631	0.597	0.561	0.529	0.502	0.479
2001	0.731	0.758	0.757	0.761	0.734	0.699	0.664	0.626	0.591	0.562	0.536
2002	0.737	0.777	0.773	0.784	0.758	0.724	0.690	0.653	0.619	0.590	0.563
2003	0.754	0.760	0.789	0.856	0.838	0.808	0.777	0.744	0.714	0.688	0.663
2004	0.716	0.643	0.684	0.770	0.760	0.739	0.718	0.697	0.678	0.662	0.647
2005	0.732	0.688	0.710	0.758	0.740	0.713	0.685	0.656	0.630	0.608	0.589
2006	0.710	0.637	0.670	0.715	0.696	0.669	0.641	0.612	0.587	0.568	0.551
2007	0.719	0.690	0.708	0.735	0.713	0.683	0.652	0.619	0.591	0.567	0.547
2008	0.723	0.661	0.633	0.631	0.610	0.586	0.562	0.538	0.516	0.498	0.481
2009	0.727	0.715	0.698	0.701	0.677	0.648	0.619	0.589	0.561	0.537	0.516
2010	0.742	0.784	0.791	0.825	0.802	0.770	0.737	0.701	0.669	0.640	0.614
2011	0.732	0.722	0.716	0.737	0.715	0.687	0.659	0.629	0.602	0.578	0.556
2012	0.732	0.699	0.700	0.714	0.691	0.660	0.630	0.597	0.569	0.545	0.524
2013	0.758	0.894	0.864	0.845	0.811	0.771	0.729	0.684	0.641	0.603	0.567
2014	0.736	0.750	0.732	0.732	0.707	0.676	0.645	0.611	0.581	0.554	0.530
2015	0.709	0.621	0.588	0.567	0.544	0.521	0.498	0.474	0.454	0.437	0.423
2016	0.731	0.725	0.702	0.702	0.679	0.650	0.622	0.592	0.565	0.541	0.519
2017	0.715	0.615	0.599	0.610	0.592	0.570	0.550	0.529	0.510	0.495	0.482
2018	0.730	0.661	0.632	0.626	0.604	0.579	0.554	0.528	0.506	0.486	0.469
2019	0.772	0.759	0.727	0.737	0.714	0.685	0.657	0.627	0.599	0.574	0.551
2020	0.811	1.067	1.033	1.021	0.982	0.933	0.879	0.821	0.765	0.713	0.665

Table 16. Estimated total landings at age in numbers (1000 fish).

Year	0	1	2	3	4	5	6	7	8	9	10
1986	356.35	3275.06	893.88	270.19	118.98	45.56	19.89	7.65	3.07	1.31	1.54
1987	338.92	1426.61	2033.44	362.17	103.28	45.20	17.39	7.76	3.14	1.35	1.60
1988	519.27	2051.98	1129.36	1135.77	192.46	54.85	24.34	9.68	4.57	1.99	2.32
1989	405.24	2373.07	1139.29	488.56	473.80	79.78	22.66	10.09	4.08	1.98	2.19
1990	376.51	1942.47	1367.36	514.54	214.61	208.58	35.44	10.30	4.79	2.05	2.54
1991	493.44	2840.63	1691.25	965.88	353.18	147.61	144.88	25.12	7.56	3.67	4.17
1992	269.01	1912.71	1213.56	576.79	318.92	116.70	49.14	49.04	8.75	2.73	3.31
1993	492.89	1424.14	1302.97	674.59	310.93	169.84	60.84	24.89	24.14	4.21	3.26
1994	465.73	2159.21	862.20	525.94	259.49	120.26	66.75	24.64	10.60	10.97	4.16
1995	343.24	1465.95	1012.80	289.41	170.56	84.34	39.35	22.25	8.56	3.93	6.64
1996	334.26	1448.96	968.38	443.05	117.81	68.67	34.18	16.36	9.75	4.03	6.28
1997	217.76	1649.26	1030.39	507.93	218.75	57.85	34.03	17.40	8.78	5.62	7.37
1998	414.95	1012.68	1089.12	504.02	228.53	96.66	25.28	14.81	7.65	3.94	6.67
1999	361.12	1992.21	643.36	516.95	227.20	102.97	44.28	12.02	7.49	4.17	7.12
2000	242.05	2092.75	1406.17	396.29	308.02	136.07	63.07	28.24	8.14	5.45	9.90
2001	362.23	1381.94	1447.32	879.58	229.58	178.00	80.18	38.45	18.06	5.50	11.99
2002	470.86	1986.33	871.01	811.85	436.75	113.56	89.95	41.91	21.01	10.35	11.38
2003	278.11	2280.49	1207.66	517.03	422.02	227.08	60.95	50.57	24.96	13.31	15.50
2004	244.91	960.01	1209.25	617.73	205.95	166.49	92.19	25.76	22.43	11.65	14.72
2005	252.99	1673.08	953.85	877.41	301.29	95.58	76.81	42.50	11.91	10.42	12.64
2006	258.01	1062.59	1150.05	548.06	376.97	123.98	39.33	31.92	17.99	5.16	10.62
2007	413.41	1665.42	1058.13	815.41	286.31	188.89	62.27	20.01	16.58	9.54	8.88
2008	291.72	1848.93	1006.58	519.51	320.12	109.20	72.78	24.54	8.13	6.95	8.23
2009	262.09	1995.48	1600.62	777.50	331.65	196.44	66.97	45.06	15.44	5.21	10.34
2010	389.90	1760.86	1641.51	1229.00	507.49	212.40	128.34	45.23	31.73	11.35	12.65
2011	248.46	1672.40	916.03	768.90	462.47	185.34	78.29	48.21	17.44	12.58	10.22
2012	212.38	1224.19	1108.37	556.17	382.39	223.10	89.80	38.45	24.21	8.99	12.55
2013	522.94	1814.13	1259.35	894.56	360.89	239.44	140.93	57.89	25.42	16.36	15.44
2014	344.76	1843.04	770.76	580.92	386.95	155.51	106.50	65.75	28.67	13.44	18.96
2015	296.79	1031.25	779.01	302.81	186.02	117.19	46.86	32.33	20.28	9.02	10.86
2016	359.13	2355.92	1166.89	759.47	240.90	139.71	88.32	36.04	25.56	16.47	17.12
2017	217.58	1148.66	1139.28	574.83	314.81	96.35	56.46	36.57	15.44	11.38	16.20
2018	339.75	1424.21	1129.39	893.68	339.93	174.87	53.00	31.09	20.28	8.63	16.02
2019	272.54	2414.61	1352.43	925.12	593.08	215.22	111.34	34.42	20.73	13.87	18.03
2020	657.60	2591.67	2458.82	1179.97	658.38	407.12	148.26	77.55	24.30	14.79	23.99

Table 17. Estimated total landings at age in whole weight (1000 lb).

Year	0	1	2	3	4	5	6	7	8	9	10
1986	243.73	3742.65	1466.61	578.43	311.52	139.32	68.68	29.09	12.59	5.71	7.06
1987	231.81	1630.29	3336.30	775.35	270.41	138.23	60.06	29.51	12.88	5.90	7.32
1988	355.17	2344.95	1852.96	2431.50	503.90	167.75	84.05	36.78	18.77	8.67	10.64
1989	277.17	2711.88	1869.26	1045.94	1240.52	243.97	78.23	38.35	16.74	8.65	10.04
1990	257.52	2219.80	2243.45	1101.56	561.90	637.84	122.37	39.14	19.65	8.94	11.65
1991	337.50	3246.19	2774.87	2067.81	924.70	451.39	500.27	95.49	31.02	16.02	19.09
1992	184.00	2185.80	1991.10	1234.81	835.01	356.87	169.69	186.40	35.92	11.91	15.15
1993	337.12	1627.47	2137.81	1444.20	814.09	519.37	210.09	94.60	99.06	18.38	14.94
1994	318.55	2467.49	1414.63	1125.97	679.40	367.77	230.50	93.67	43.50	47.87	19.05
1995	234.77	1675.25	1661.72	619.59	446.56	257.92	135.87	84.56	35.13	17.16	30.44
1996	228.62	1655.84	1588.85	948.50	308.46	210.00	118.01	62.19	40.01	17.60	28.80
1997	148.95	1884.73	1690.58	1087.40	572.74	176.90	117.51	66.15	36.02	24.51	33.78
1998	283.81	1157.26	1786.93	1079.04	598.33	295.58	87.30	56.31	31.40	17.20	30.56
1999	247.00	2276.64	1055.57	1106.70	594.87	314.87	152.88	45.68	30.72	18.18	32.62
2000	165.56	2391.54	2307.13	848.40	806.47	416.11	217.77	107.33	33.40	23.76	45.39
2001	247.76	1579.25	2374.64	1883.04	601.09	544.32	276.87	146.13	74.11	23.99	54.94
2002	322.06	2269.93	1429.09	1738.05	1143.51	347.27	310.61	159.31	86.20	45.15	52.14
2003	190.22	2606.08	1981.43	1106.89	1104.94	694.41	210.47	192.20	102.42	58.07	71.05
2004	167.51	1097.07	1984.04	1322.47	539.23	509.12	318.33	97.91	92.04	50.82	67.49
2005	173.04	1911.95	1565.01	1878.40	788.85	292.29	265.24	161.53	48.88	45.47	57.94
2006	176.47	1214.30	1886.92	1173.30	987.00	379.15	135.81	121.33	73.83	22.52	48.69
2007	282.76	1903.19	1736.09	1745.67	749.62	577.64	215.02	76.07	68.04	41.63	40.70
2008	199.53	2112.90	1651.52	1112.19	838.14	333.93	251.31	93.26	33.36	30.30	37.72
2009	179.26	2280.38	2626.16	1664.52	868.34	600.73	231.24	171.27	63.36	22.74	47.41
2010	266.68	2012.26	2693.25	2631.10	1328.72	649.53	443.17	171.90	130.18	49.53	57.98
2011	169.94	1911.17	1502.95	1646.10	1210.85	566.78	270.32	183.26	71.54	54.88	46.84
2012	145.26	1398.98	1818.52	1190.67	1001.19	682.24	310.06	146.15	99.32	39.22	57.51
2013	357.68	2073.14	2066.24	1915.11	944.89	732.22	486.63	220.05	104.32	71.36	70.76
2014	235.81	2106.18	1264.61	1243.66	1013.11	475.54	367.74	249.92	117.64	58.62	86.89
2015	203.00	1178.48	1278.14	648.28	487.05	358.38	161.79	122.88	83.21	39.37	49.78
2016	245.64	2692.29	1914.54	1625.92	630.74	427.25	304.95	136.97	104.88	71.85	78.48
2017	148.82	1312.65	1869.24	1230.63	824.24	294.64	194.94	138.99	63.34	49.66	74.24
2018	232.38	1627.55	1853.01	1913.23	890.02	534.76	183.01	118.17	83.20	37.64	73.43
2019	186.41	2759.36	2218.97	1980.55	1552.81	658.16	384.45	130.83	85.06	60.49	82.61
2020	449.78	2961.69	4034.24	2526.15	1723.79	1244.99	511.94	294.75	99.71	64.53	109.93

Table 18. Estimated time series of landings in number (1000s) for commercial handline (L.cH), commercial pound net (L.cP), commercial gill net (L.cG), commercial cast net (L.cC), general recreational (L.GR), general recreational discards (D.GR) and shrimp bycatch (D.SB), total landings and total dead discards.

Year	L.cH	L.cP	L.cG	L.cC	L.GR	D.GR	D.SB	Total.L	Total.D
1986	43.76	156.91	3029.99	0.00	1762.82	99.91	293.50	4993.48	393.40
1987	57.43	319.35	2379.32	0.00	1584.76	10.74	246.21	4340.86	256.95
1988	32.29	266.07	2074.59	0.00	2753.65	26.28	295.15	5126.59	321.43
1989	19.02	344.78	2023.18	0.00	2613.76	162.04	349.38	5000.74	511.42
1990	53.04	335.96	1683.20	0.00	2606.99	164.99	270.38	4679.19	435.38
1991	66.72	305.42	2327.83	0.00	3977.42	204.54	336.07	6677.39	540.61
1992	22.75	255.72	1619.31	0.00	2622.88	141.40	253.75	4520.66	395.15
1993	44.21	205.91	2662.81	0.00	1579.78	119.14	268.21	4492.71	387.36
1994	26.27	224.77	2389.20	0.00	1869.73	235.69	300.31	4509.97	536.00
1995	98.49	137.28	2131.71	6.91	1072.64	148.45	304.64	3447.03	453.09
1996	66.88	201.05	1750.23	30.26	1403.32	225.92	247.77	3451.74	473.69
1997	60.19	139.77	1689.89	96.38	1768.91	219.43	287.51	3755.14	506.94
1998	69.77	73.37	1664.24	30.99	1565.95	99.25	259.45	3404.31	358.70
1999	87.52	185.80	1215.59	29.33	2400.63	300.96	290.45	3918.87	591.41
2000	145.60	108.19	1165.20	164.17	3113.00	369.63	270.72	4696.15	640.35
2001	160.28	121.85	1014.81	401.46	2934.41	194.69	216.38	4632.82	411.06
2002	198.59	79.08	815.66	419.93	3351.70	360.66	237.46	4864.96	598.12
2003	180.68	61.99	697.47	839.64	3317.91	503.24	184.86	5097.68	688.11
2004	282.13	46.64	448.47	1035.30	1758.55	209.76	180.57	3571.09	390.32
2005	400.64	31.76	796.13	720.63	2359.33	308.26	195.44	4308.49	503.70
2006	336.64	28.13	1033.50	702.54	1523.89	129.57	133.24	3624.70	262.82
2007	369.14	33.44	1095.14	577.59	2469.54	325.08	109.39	4544.85	434.46
2008	415.91	131.35	694.74	321.72	2652.96	451.38	118.26	4216.68	569.64
2009	461.29	237.30	884.32	445.01	3278.89	343.04	69.97	5306.81	413.00
2010	562.27	89.66	797.50	806.49	3714.53	457.40	112.68	5970.46	570.08
2011	398.66	56.07	648.94	539.00	2777.68	294.60	116.99	4420.34	411.58
2012	496.34	34.76	847.97	425.19	2076.32	239.50	132.25	3880.59	371.75
2013	599.94	16.56	698.57	148.01	3884.27	544.81	94.58	5347.35	639.39
2014	782.93	22.88	599.27	240.39	2669.79	380.19	111.45	4315.26	491.64
2015	573.92	36.92	642.60	79.39	1499.61	213.29	126.19	2832.44	339.48
2016	668.95	50.89	722.46	314.35	3448.89	426.44	125.05	5205.55	551.49
2017	658.00	24.39	701.11	456.49	1787.55	298.65	113.89	3627.55	412.54
2018	747.54	23.53	871.03	317.09	2471.66	628.22	89.46	4430.85	717.69
2019	627.99	102.19	685.74	545.80	4009.68	862.39	119.06	5971.39	981.45
2020	612.61	50.51	918.60	291.61	6369.12	1058.02	117.52	8242.46	1175.55

Table 19. Estimated time series of landings in whole weight (1000 lb) for commercial handline (L.cH), commercial pound net (L.cP), commercial gill net (L.cG), commercial cast net (L.cC), general recreational (L.GR), general recreational discards (D.GR) and shrimp bycatch (D.SB), total landings and total dead discards.

Year	L.cH	L.cP	L.cG	L.cC	L.GR	D.GR	D.SB.D	Total.L	Total.D
1986	78.44	201.74	4080.71	0.00	2244.51	63.42	156.98	6605.40	220.40
1987	106.50	470.62	3630.15	0.00	2290.79	5.44	110.97	6498.06	116.40
1988	64.87	402.23	3287.10	0.00	4060.94	12.98	130.90	7815.13	143.89
1989	39.67	509.06	3182.22	0.00	3809.81	87.47	164.77	7540.76	252.24
1990	111.86	509.41	2696.01	0.00	3906.56	85.87	124.25	7223.84	210.11
1991	144.01	468.20	3793.16	0.00	6058.99	109.67	157.73	10464.36	267.40
1992	50.24	396.67	2684.84	0.00	4074.92	79.92	123.81	7206.67	203.72
1993	99.07	328.29	4409.69	0.00	2480.08	56.36	115.59	7317.14	171.95
1994	58.25	329.57	3701.24	0.00	2719.34	122.46	137.85	6808.38	260.31
1995	209.64	199.03	3234.96	15.42	1539.91	76.68	139.25	5198.96	215.93
1996	139.44	294.40	2679.22	65.92	2027.89	115.19	112.25	5206.88	227.44
1997	126.98	207.19	2673.93	210.19	2620.97	128.43	144.07	5839.26	272.51
1998	149.03	115.48	2689.96	68.32	2400.96	45.41	109.46	5423.74	154.87
1999	188.06	271.23	1884.74	66.38	3465.33	159.41	135.14	5875.74	294.54
2000	311.52	161.82	1862.78	361.29	4665.44	219.67	137.28	7362.86	356.95
2001	348.82	196.12	1700.67	891.10	4669.42	94.48	94.82	7806.13	189.30
2002	438.66	121.27	1316.57	966.39	5060.42	178.34	105.36	7903.31	283.70
2003	390.94	90.68	1091.82	1892.09	4852.65	291.64	91.93	8318.18	383.56
2004	590.76	71.09	709.89	2238.38	2635.92	102.10	79.28	6246.03	181.38
2005	841.43	47.03	1255.86	1574.81	3469.45	170.89	93.99	7188.58	264.88
2006	707.66	42.93	1652.05	1525.70	2290.98	65.01	59.71	6219.32	124.72
2007	775.88	50.05	1717.67	1268.88	3623.94	161.20	48.63	7436.43	209.83
2008	869.80	192.36	1080.00	702.58	3849.42	245.51	56.08	6694.16	301.59
2009	977.72	363.09	1440.10	966.47	5008.03	194.72	34.25	8755.41	228.96
2010	1228.01	144.16	1346.85	1798.59	5916.71	229.27	50.46	10434.31	279.73
2011	891.72	87.48	1085.30	1239.75	4330.38	162.73	56.11	7634.63	218.84
2012	1118.97	55.28	1432.52	977.60	3304.74	128.81	62.21	6889.12	191.02
2013	1359.10	26.56	1167.30	344.58	6144.85	259.62	40.95	9042.39	300.57
2014	1748.91	33.89	941.86	562.60	3932.46	200.08	51.62	7219.72	251.70
2015	1223.50	54.51	982.70	177.38	2172.27	103.20	55.19	4610.37	158.39
2016	1401.61	73.67	1108.32	689.18	4960.73	234.92	59.86	8233.51	294.78
2017	1379.05	36.90	1117.30	985.87	2682.27	157.79	52.90	6201.39	210.68
2018	1600.54	36.55	1421.58	699.91	3787.82	314.21	40.00	7546.40	354.21
2019	1382.21	157.31	1137.03	1233.65	6189.49	510.81	60.22	10099.69	571.03
2020	1375.19	82.62	1569.24	666.17	10328.29	514.48	51.57	14021.50	566.04

Table 20. Estimated total dead discards at age in numbers (1000 fish).

Year	0	1	2	3	4	5	6	7	8	9	10
1986	316.49	76.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1987	236.17	20.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1988	297.27	24.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1989	448.08	63.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1990	386.40	48.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1991	472.83	67.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1992	336.76	58.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1993	359.80	27.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1994	473.95	62.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1995	405.04	48.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1996	421.64	52.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1997	420.12	86.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1998	337.84	20.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1999	515.11	76.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2000	517.09	123.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2001	374.52	36.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2002	536.13	61.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2003	555.66	132.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2004	353.88	36.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2005	423.73	79.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2006	235.51	27.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2007	385.42	49.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2008	477.02	92.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2009	334.84	78.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2010	501.01	69.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2011	343.67	67.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2012	317.51	54.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2013	576.01	63.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2014	420.90	70.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2015	307.11	32.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2016	458.83	92.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2017	353.73	58.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2018	628.55	89.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2019	766.92	214.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2020	1044.65	130.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 21. Estimated total dead discards at age in whole weight (1000 lb).

Year	0	1	2	3	4	5	6	7	8	9	10
1986	119.43	100.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1987	89.12	27.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1988	112.18	31.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1989	169.08	83.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1990	145.81	64.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1991	178.42	88.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1992	127.08	76.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1993	135.77	36.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1994	178.85	81.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1995	152.84	63.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1996	159.11	68.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1997	158.53	113.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1998	127.48	27.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1999	194.38	100.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2000	195.13	161.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2001	141.33	47.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2002	202.31	81.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2003	209.68	173.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2004	133.54	47.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2005	159.90	104.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2006	88.87	35.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2007	145.44	64.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2008	180.01	121.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2009	126.35	102.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2010	189.06	90.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2011	129.69	89.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2012	119.81	71.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2013	217.36	83.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2014	158.83	92.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2015	115.89	42.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2016	173.14	121.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2017	133.48	77.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2018	237.19	117.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2019	289.40	281.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2020	394.20	171.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 22. Estimated status indicators, benchmarks, and related quantities from the base run of the Beaufort catch-age model, conditional on estimated current selectivities averaged across fleets. Also presented are median values and measures of precision (standard errors, SE) from the Monte Carlo/Bootstrap ensemble (MCBE) analysis. Rate estimates (F) are in units of y^{-1} ; status indicators are dimensionless; and biomass estimates are in units of metric tons or pounds, as indicated. Spawning stock biomass (SSB) is measured as total mature female biomass. The definitions of MSST in this assessment is $MSST = 75\%SSB_{MSY}$.

Quantity	Units	Estimate	Median	SE
F_{MSY}	y^{-1}	0.516	0.523	0.111
$75\%F_{MSY}$	y^{-1}	0.387	0.392	0.083
$F_{30\%}$	y^{-1}	0.608	0.615	0.059
$F_{40\%}$	y^{-1}	0.410	0.414	0.038
B_{MSY}	metric tons	19588	19821	2232
SSB_{MSY}	metric tons	6406	6410	1122
MSST	metric tons	4804	4808	842
MSY	1000 lb whole	8210	8351	411
R_{MSY}	thousands	22792	23392	3015
$L_{85\%Fmsy}$	1000 lb whole	8149	8287	410
$L_{75\%Fmsy}$	1000 lb whole	8024	8158	408
$L_{65\%Fmsy}$	1000 lb whole	7807	7932	407
$F[2018 - 2020]$	y^{-1}	0.40	0.39	0.05
$F_{2018-2020}/F_{MSY}$	—	0.77	0.74	0.21
$SSB_{2020}/MSST$	—	1.40	1.42	0.34
SSB_{2020}/SSB_{MSY}	—	1.05	1.07	0.25

Table 23. Results from sensitivity runs of the Beaufort Assessment Model. Current F represented by geometric mean of last three assessment years. Spawning stock was based on total (population) fecundity of mature females. Runs should not all be considered equally plausible.

Run	Description	F_{MSY}	SSB_{MSY} (mt)	B_{MSY} (mt)	MSY (1000 lb)	$F_{2018-2020}/F_{MSY}$	SSB/SSB_{MSY}	$SSB_{2020}/MSST$	R0 (1000)
Base	—	0.516	6406	19588	8210	0.77	1.05	1.4	21939
S1	Drop cH Index	0.541	6090	18647	7874	0.88	0.89	1.18	20835
S2	High M	0.661	5846	20962	9290	0.48	1.47	1.96	30852
S3	Low M	0.427	7408	20419	8085	1.06	0.78	1.05	18153
S4	High Steep	0.737	4727	16298	8477	0.54	1.42	1.89	20014
S5	Low Steep	0.369	9057	25444	8485	1.07	0.74	0.99	26379
S6	High GR Discard M	0.478	6703	20205	7996	0.83	1	1.33	22253
S7	Low GR Discard M	0.566	6066	18891	8467	0.7	1.11	1.48	21626

Table 24. Projection results with fishing mortality rate fixed at $F = F_{\text{current}}$ starting in 2023. Interim period (2021-2022) assumed constant landings based on the average of the last 3 years of the assessment. R = number of age-0 recruits (in 1000s), F = fishing mortality rate (per year), S = spawning stock (mt) at peak spawning time, L = landings expressed in numbers (n , in 1000s) or whole weight (w , in 1000 lb), and D = dead discards expressed in numbers (n , in 1000s) or whole weight (w , in 1000 lb), $pr.rebuild$ = proportion of stochastic projection replicates with $SSB \geq SSB_{\text{MSY}}$. The extension b indicates expected values (deterministic) from the base run; the extension med indicates median values from the stochastic projections.

Year	R.b	R.med	F.b	F.med	S.b(mt)	S.med(mt)	L.b(n)	L.med(n)	L.b(w)	L.med(w)	D.b(n)	D.med(n)	D.b(w)	D.med(w)	pr.reb
2021	21287	21728	0.85	0.81	4761	4928	6575	6471	10556	10450	1777	1518	842	745	0.193
2022	20531	17043	1.10	1.03	4164	4383	7342	7198	10556	10441	2069	1725	1016	885	0.124
2023	18993	14749	0.40	0.39	3239	3259	2843	2557	3907	3732	741	557	375	296	0.113
2024	21667	17148	0.40	0.39	5109	4770	3459	3010	4930	4456	836	633	416	326	0.294
2025	22519	18049	0.40	0.39	6048	5567	4012	3470	5885	5225	880	676	447	353	0.403

Table 25. Projection results with fishing mortality rate fixed at $F = F_{MSY}$ starting in 2023. Interim period (2021-2022) assumed constant landings based on the average of the last 3 years of the assessment. R = number of age-0 recruits (in 1000s), F = fishing mortality rate (per year), S = spawning stock (mt) at peak spawning time, L = landings expressed in numbers (n , in 1000s) or whole weight (w , in 1000 lb), and D = dead discards expressed in numbers (n , in 1000s) or whole weight (w , in 1000 lb), $pr.rebuild$ = proportion of stochastic projection replicates with $SSB \geq SSB_{MSY}$. The extension b indicates expected values (deterministic) from the base run; the extension med indicates median values from the stochastic projections.

Year	R.b	R.med	F.b	F.med	S.b(mt)	S.med(mt)	L.b(n)	L.med(n)	L.b(w)	L.med(w)	D.b(n)	D.med(n)	D.b(w)	D.med(w)	pr.reb
2021	21287	21728	0.85	0.81	4761	4928	6575	6471	10556	10450	1777	1518	842	745	0.193
2022	20531	17043	1.10	1.03	4164	4383	7342	7198	10556	10441	2069	1725	1016	885	0.124
2023	18993	14749	0.52	0.52	3239	3259	3570	3415	4891	4909	953	764	480	402	0.113
2024	21128	16681	0.52	0.52	4626	4149	4125	3757	5796	5440	1049	842	519	432	0.181
2025	21804	17407	0.52	0.52	5244	4552	4612	4118	6606	5996	1093	884	550	458	0.230

Table 26. Projection results with fishing mortality rate fixed at $F = 75\%F_{MSY}$ starting in 2023. Interim period (2021-2022) assumed constant landings based on the average of the last 3 years of the assessment. R = number of age-0 recruits (in 1000s), F = fishing mortality rate (per year), S = spawning stock (mt) at peak spawning time, L = landings expressed in numbers (n , in 1000s) or whole weight (w , in 1000 lb), and D = dead discards expressed in numbers (n , in 1000s) or whole weight (w , in 1000 lb), $pr.rebuild$ = proportion of stochastic projection replicates with $SSB \geq SSB_{MSY}$. The extension b indicates expected values (deterministic) from the base run; the extension med indicates median values from the stochastic projections.

Year	R.b	R.med	F.b	F.med	S.b(mt)	S.med(mt)	L.b(n)	L.med(n)	L.b(w)	L.med(w)	D.b(n)	D.med(n)	D.b(w)	D.med(w)	pr.reb
2021	21287	21728	0.85	0.81	4761	4928	6575	6471	10556	10450	1777	1518	842	745	0.193
2022	20531	17043	1.10	1.03	4164	4383	7342	7198	10556	10441	2069	1725	1016	885	0.124
2023	18993	14749	0.39	0.39	3239	3259	2784	2667	3827	3850	725	582	367	307	0.113
2024	21708	17212	0.39	0.39	5149	4655	3401	3117	4853	4597	819	661	408	340	0.260
2025	22573	18160	0.39	0.39	6116	5374	3957	3573	5815	5342	863	704	438	368	0.360

4.19 Figures

Figure 1. Mean length at age (mm) of the population (purple, solid), females (green, dashed) and the fished population (yellow, dotted).

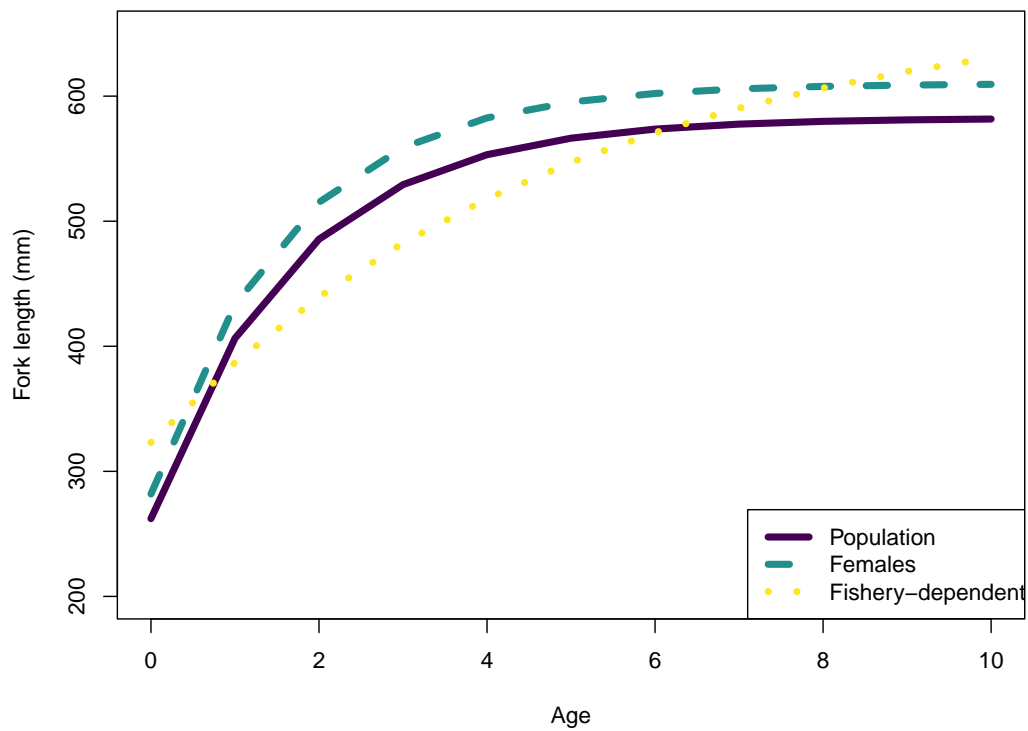


Figure 2. Observed (open circles) and estimated (solid line) annual age compositions by fleet. In panel definition of series; acomp refers to age compositions, cH to commercial handline, cP to pound nets, cG to gill nets, cC to cast nets, and GR to recreation.

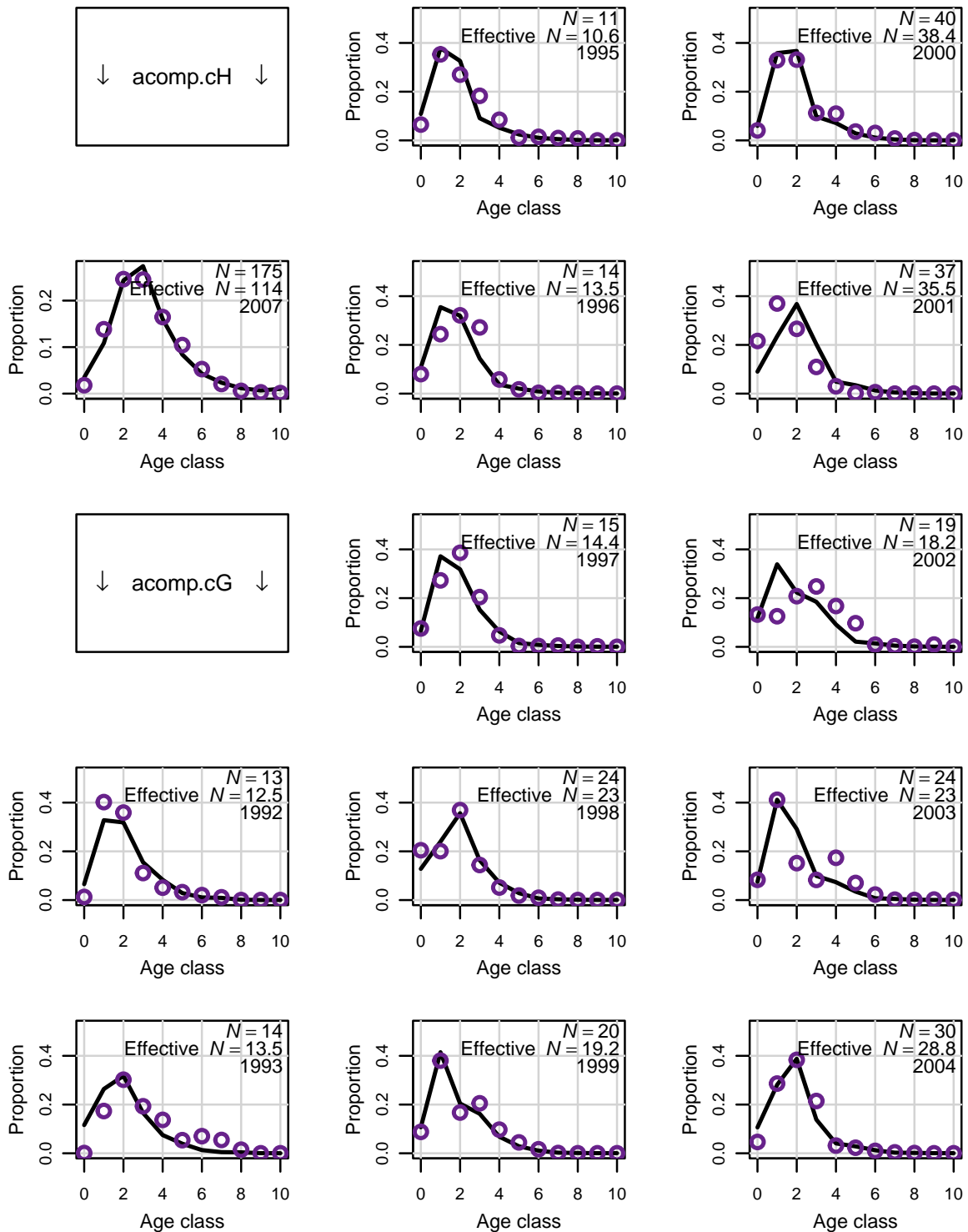


Figure 2. (cont.) Observed (open circles) and estimated (solid line) annual age compositions by fleet.

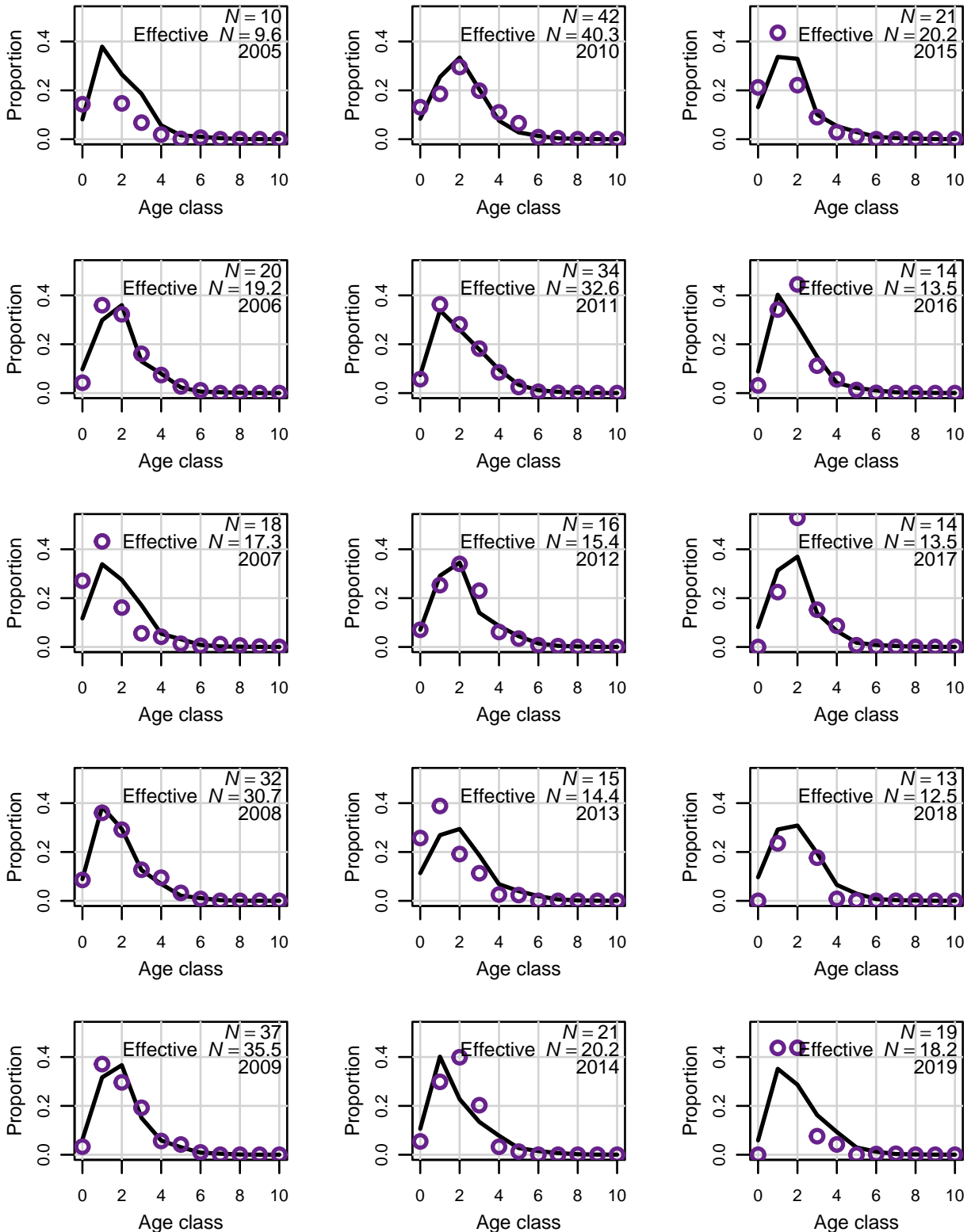


Figure 2. (cont.) Observed (open circles) and estimated (solid line) annual age compositions by fleet.

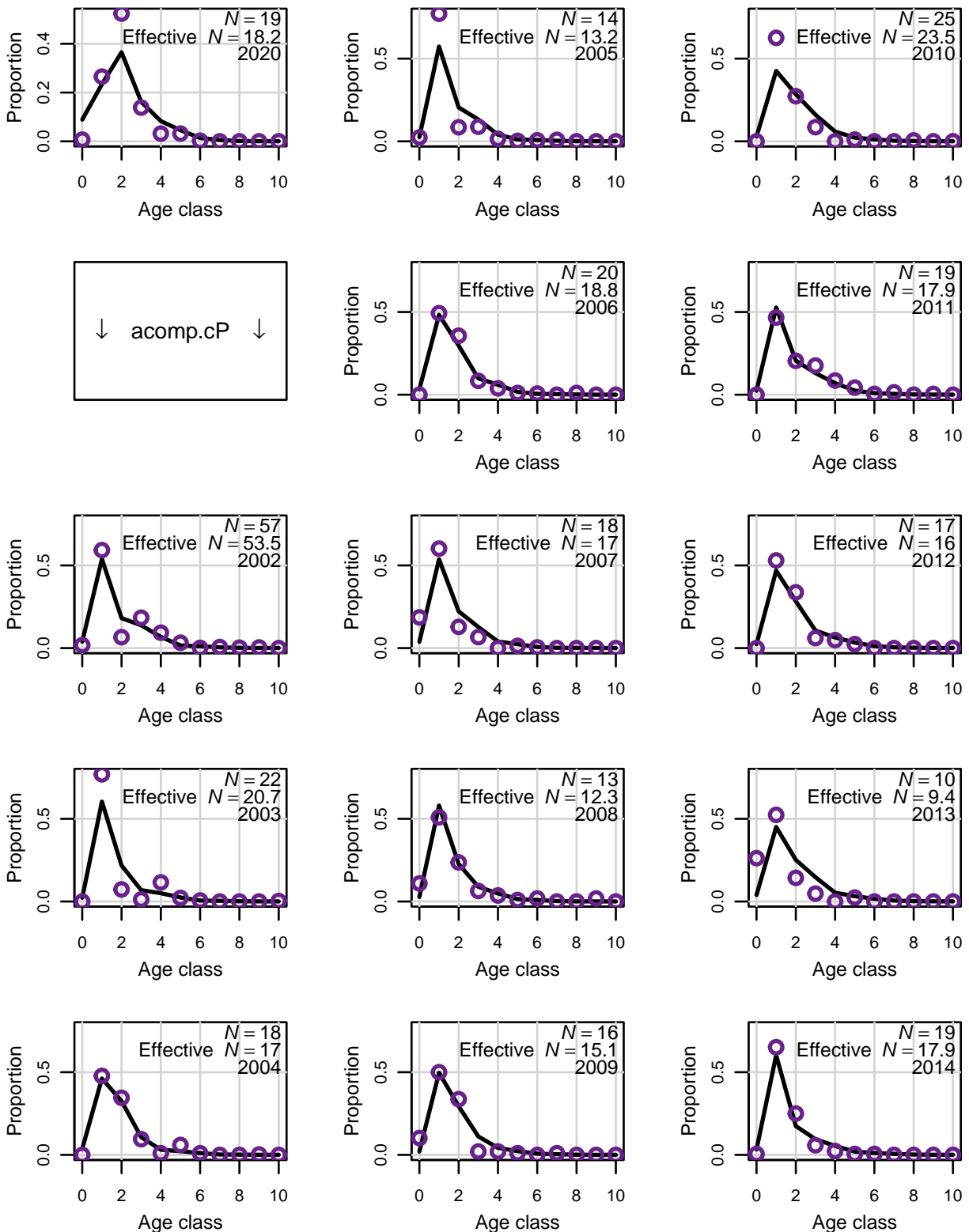


Figure 2. (cont.) Observed (open circles) and estimated (solid line) annual age compositions by fleet.

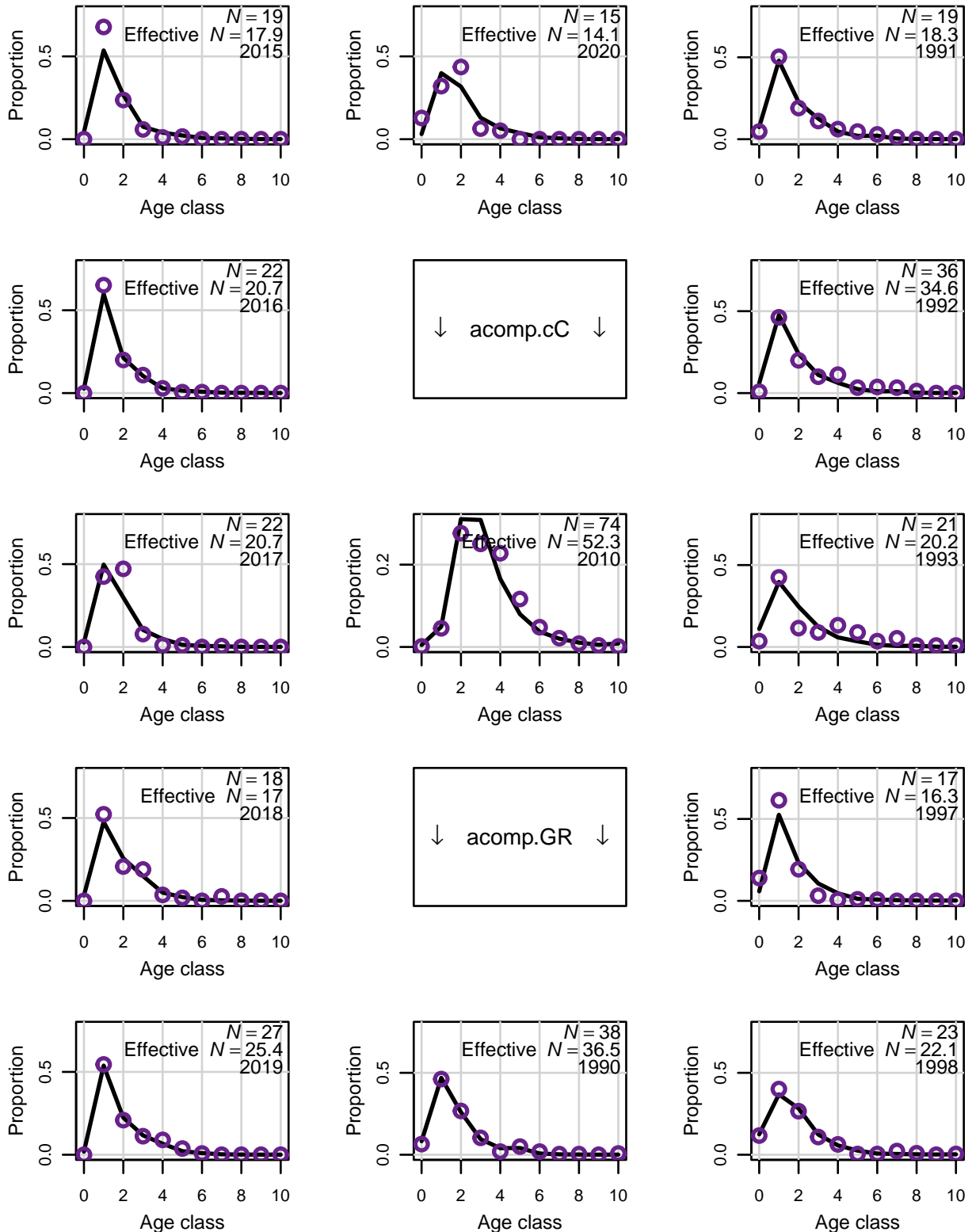


Figure 2. (cont.) Observed (open circles) and estimated (solid line) annual age compositions by fleet.

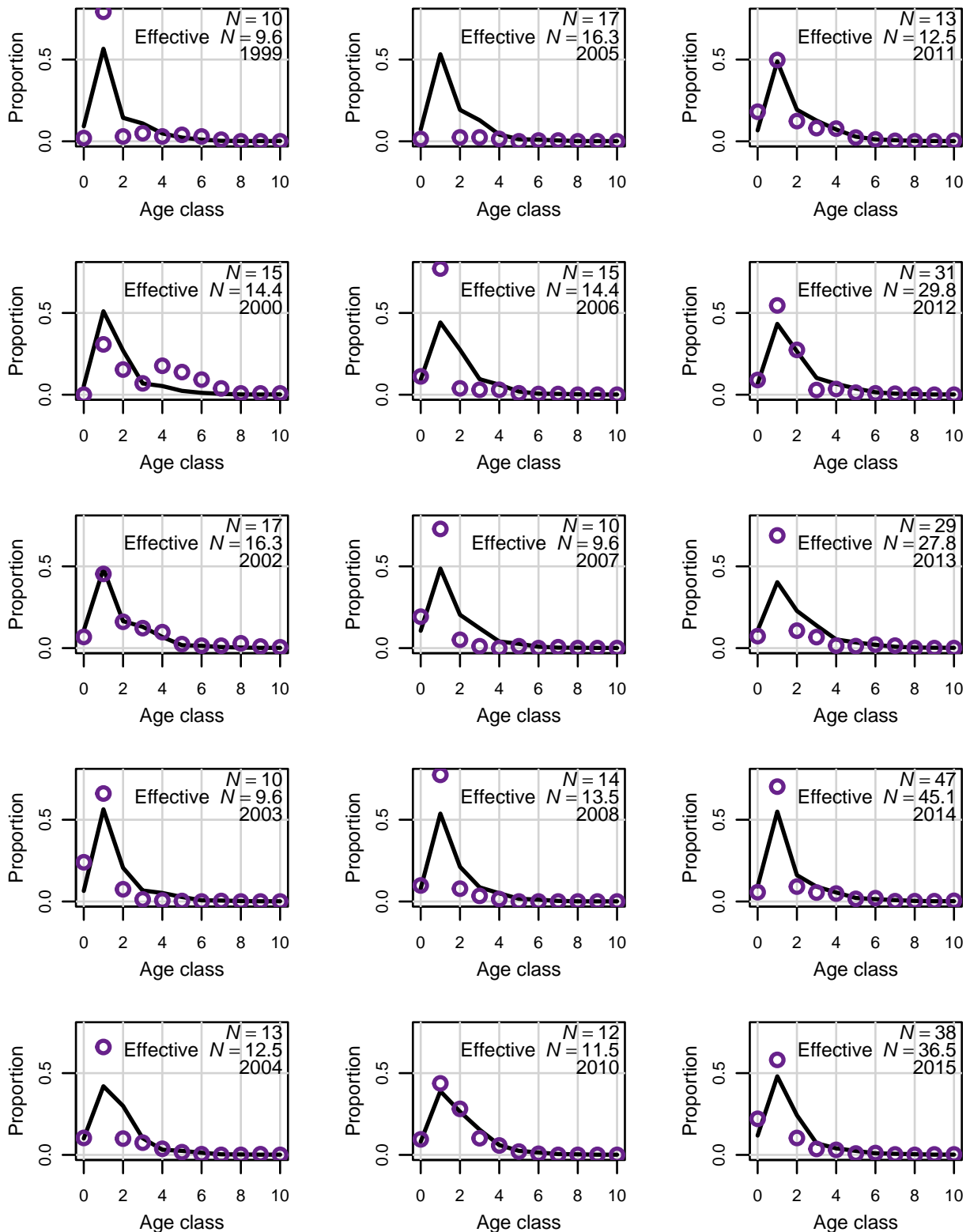


Figure 2. (cont.) Observed (open circles) and estimated (solid line) annual age compositions by fleet.

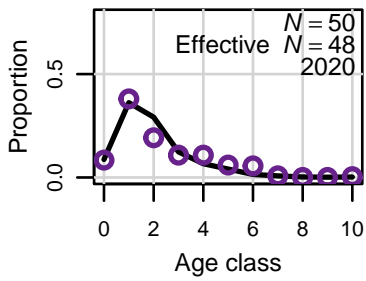
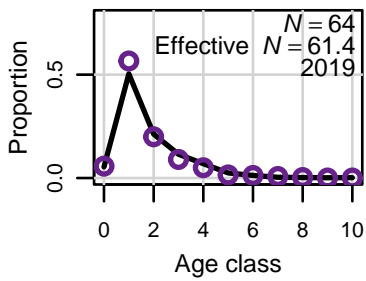
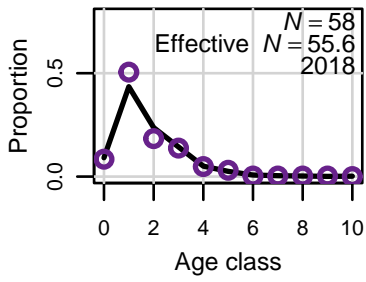
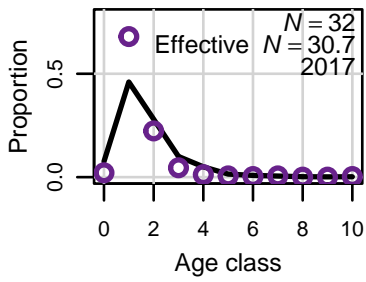
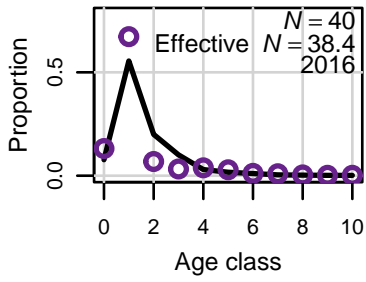


Figure 3. Top panel is a bubble plot of age composition residuals from commercial handline landings; blue represents overestimates and orange underestimates. Bottom panel shows correlation between predicted and observed values. The year is the approximate midpoint of the pooled annual compositions.

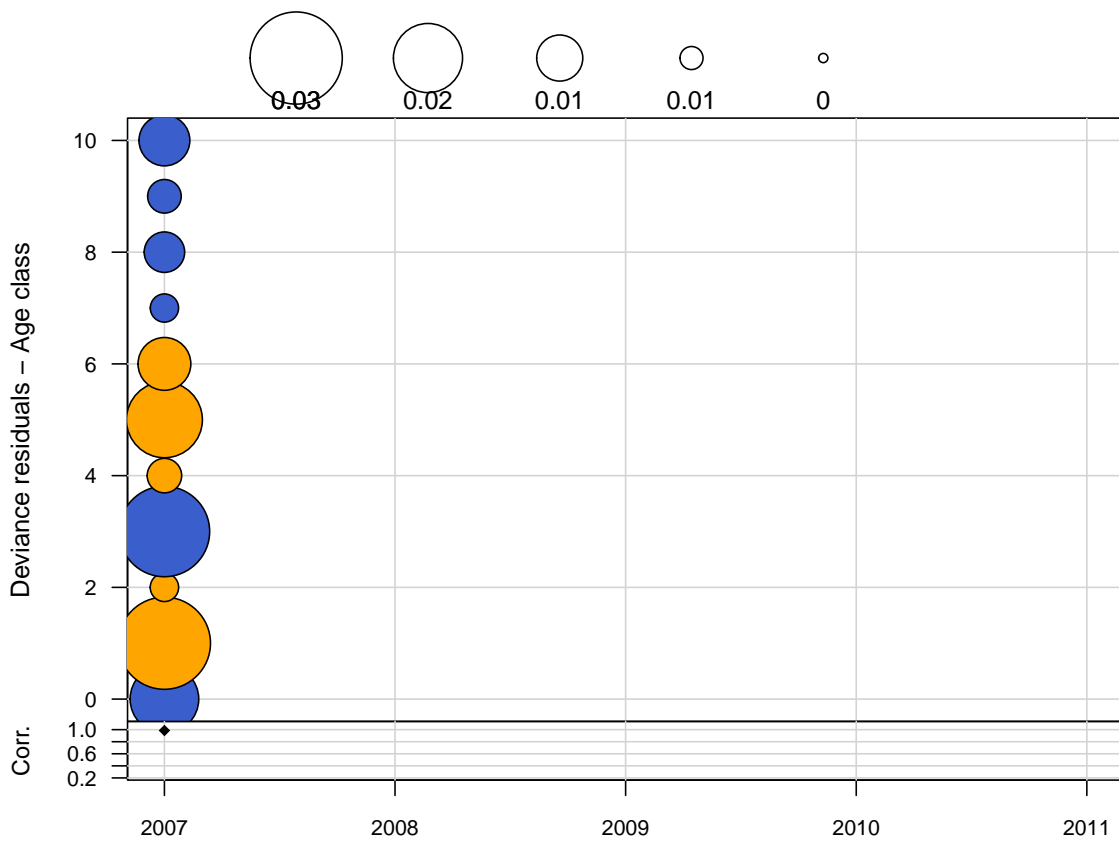


Figure 3. (cont.) Top panel is a bubble plot of age composition residuals from commercial pound net landings; blue represents overestimates and orange underestimates. Bottom panel shows correlation between predicted and observed values.

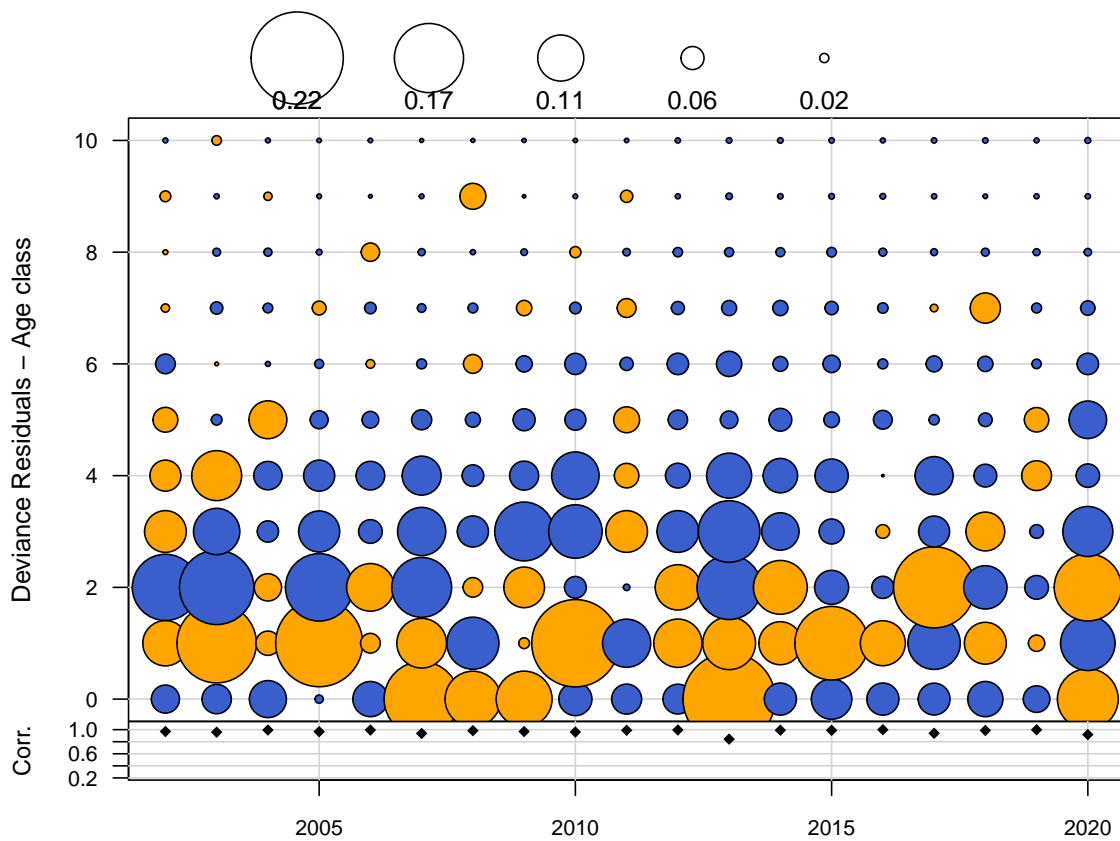


Figure 3. (cont.) Top panel is a bubble plot of age composition residuals from commercial gill net landings; blue represents overestimates and orange underestimates. Bottom panel shows correlation between predicted and observed values.

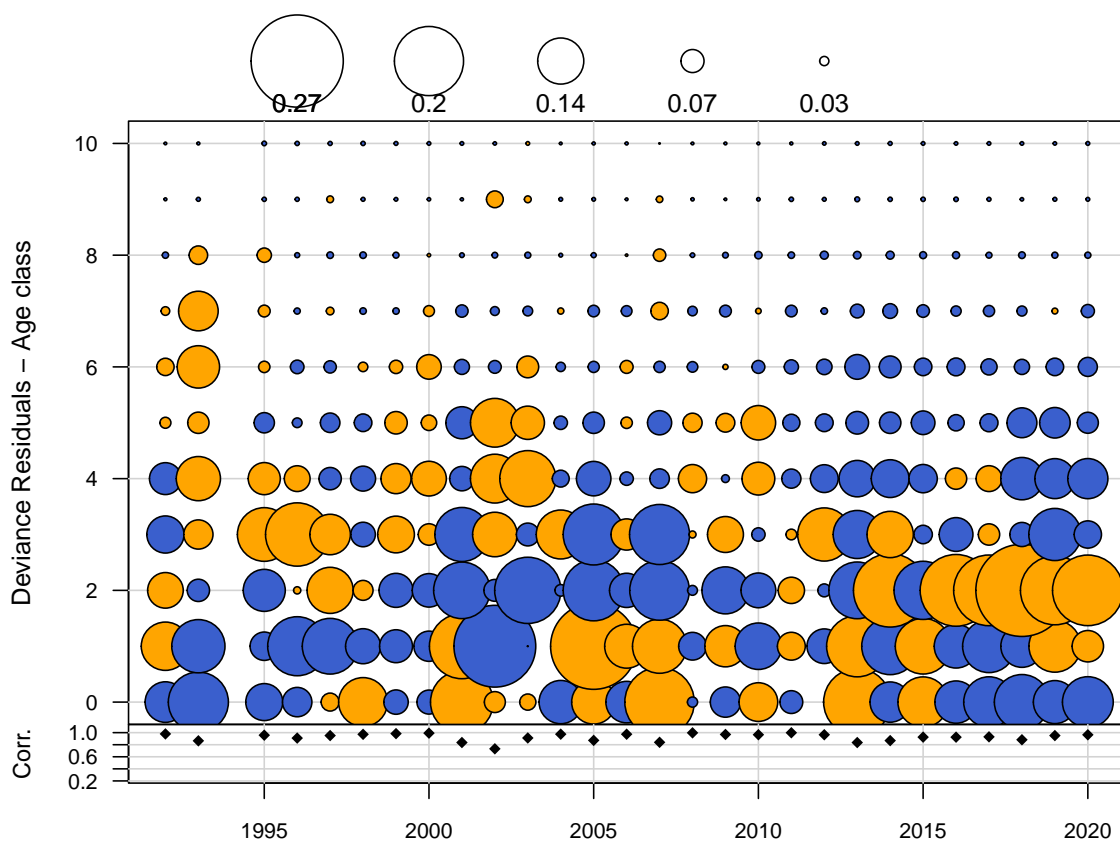


Figure 3. (cont.) Top panel is a bubble plot of age composition residuals from commercial cast net landings; blue represents overestimates and orange underestimates. Bottom panel shows correlation between predicted and observed values. The year is the approximate midpoint of the pooled annual compositions.

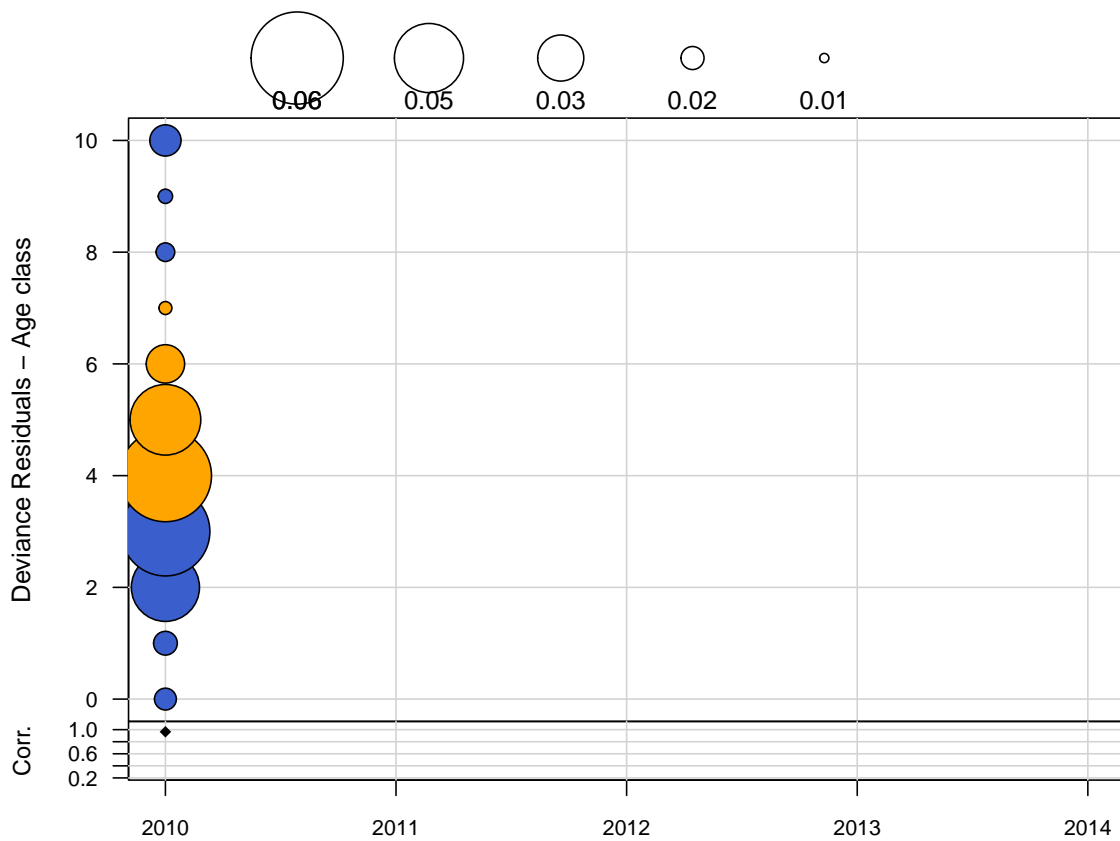


Figure 3. (cont.) Top panel is a bubble plot of age composition residuals from recreational landings; blue represents overestimates and orange underestimates. Bottom panel shows correlation between predicted and observed values.

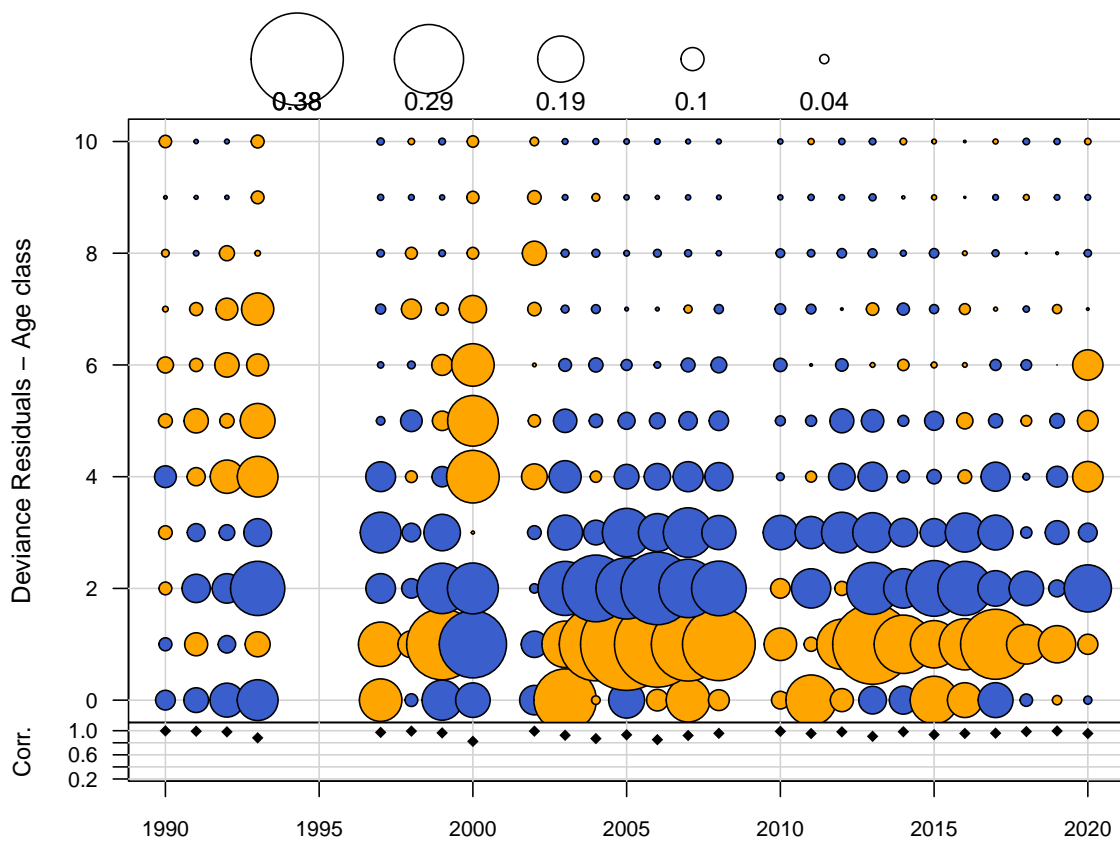


Figure 4. Observed (open circles) and estimated (line, solid circles) commercial handline landings (1000 lb whole weight).

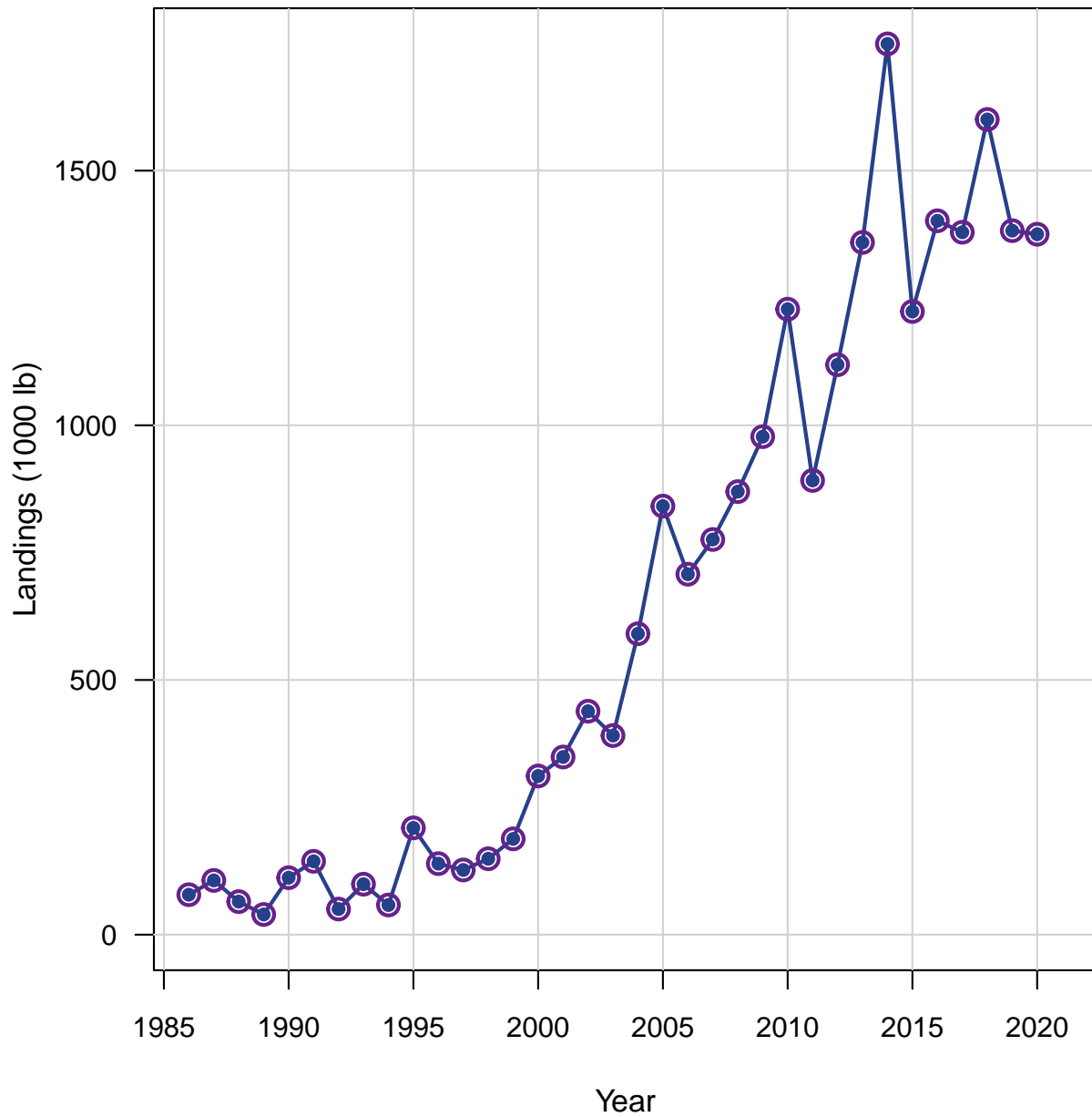


Figure 5. Observed (open circles) and estimated (line, solid circles) commercial pound net landings (1000 lb whole weight).

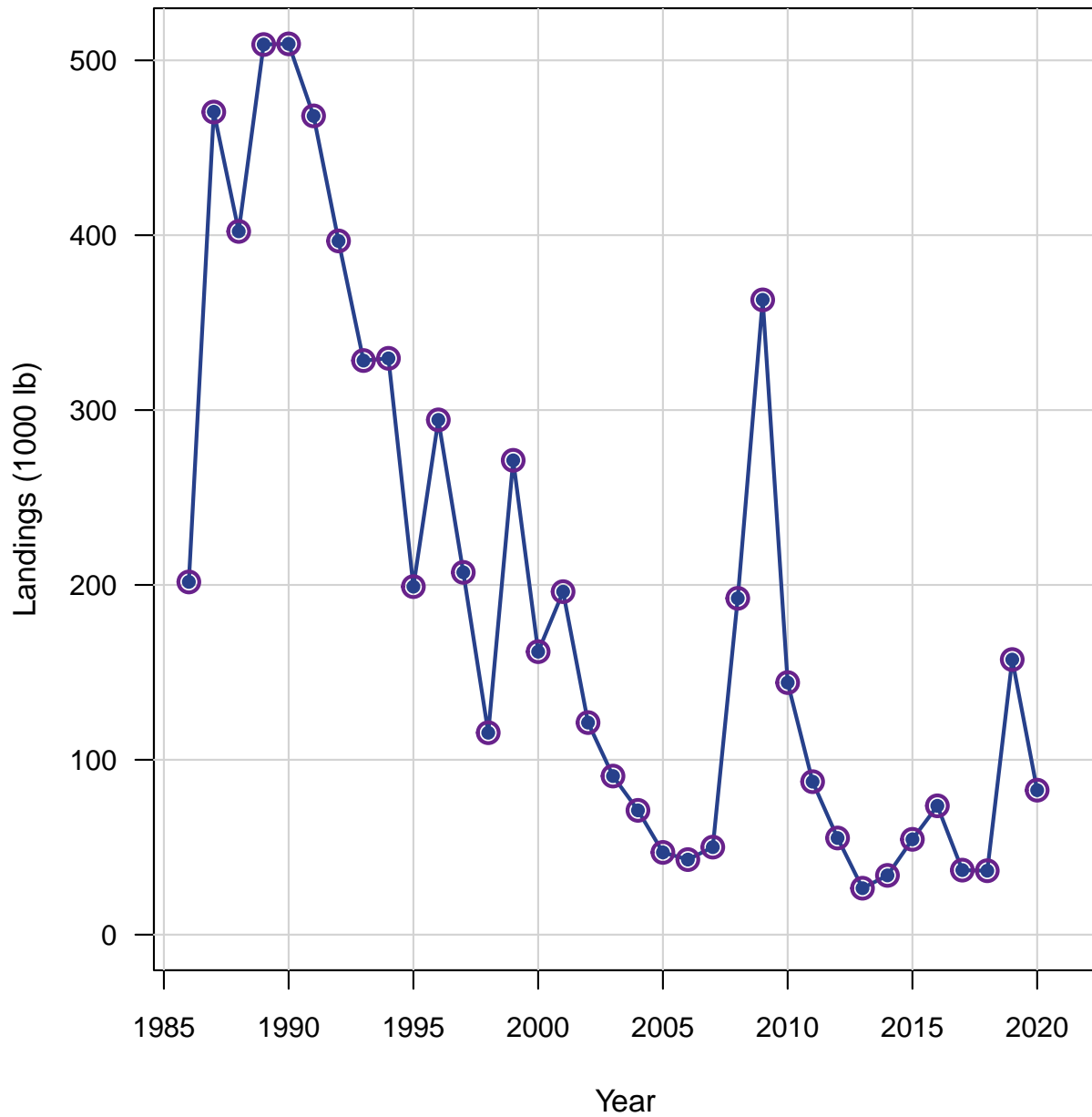


Figure 6. Observed (open circles) and estimated (line, solid circles) commercial gillnet landings (1000 lb whole weight).

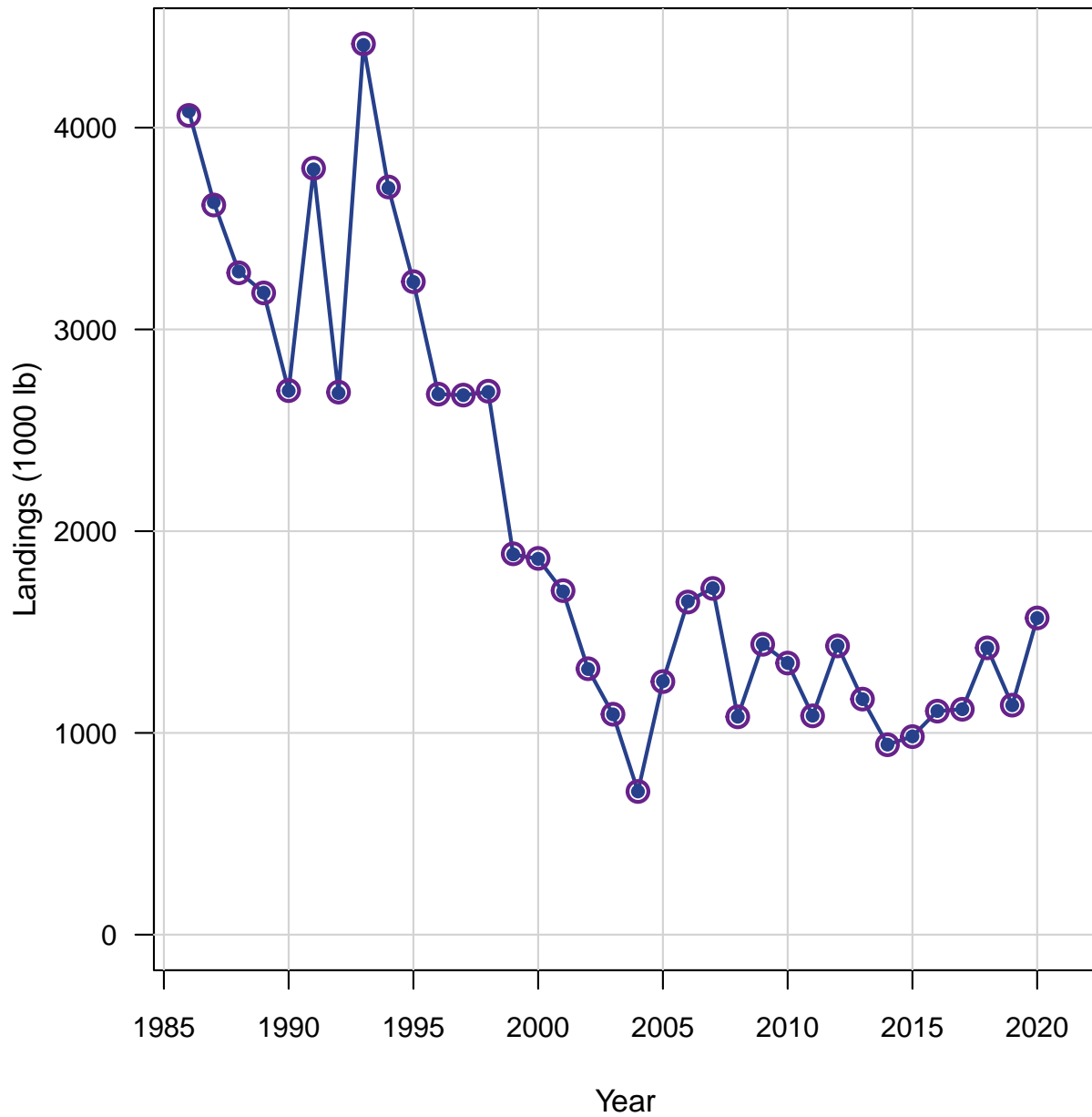


Figure 7. Observed (open circles) and estimated (line, solid circles) commercial cast net landings (1000 lb whole weight).

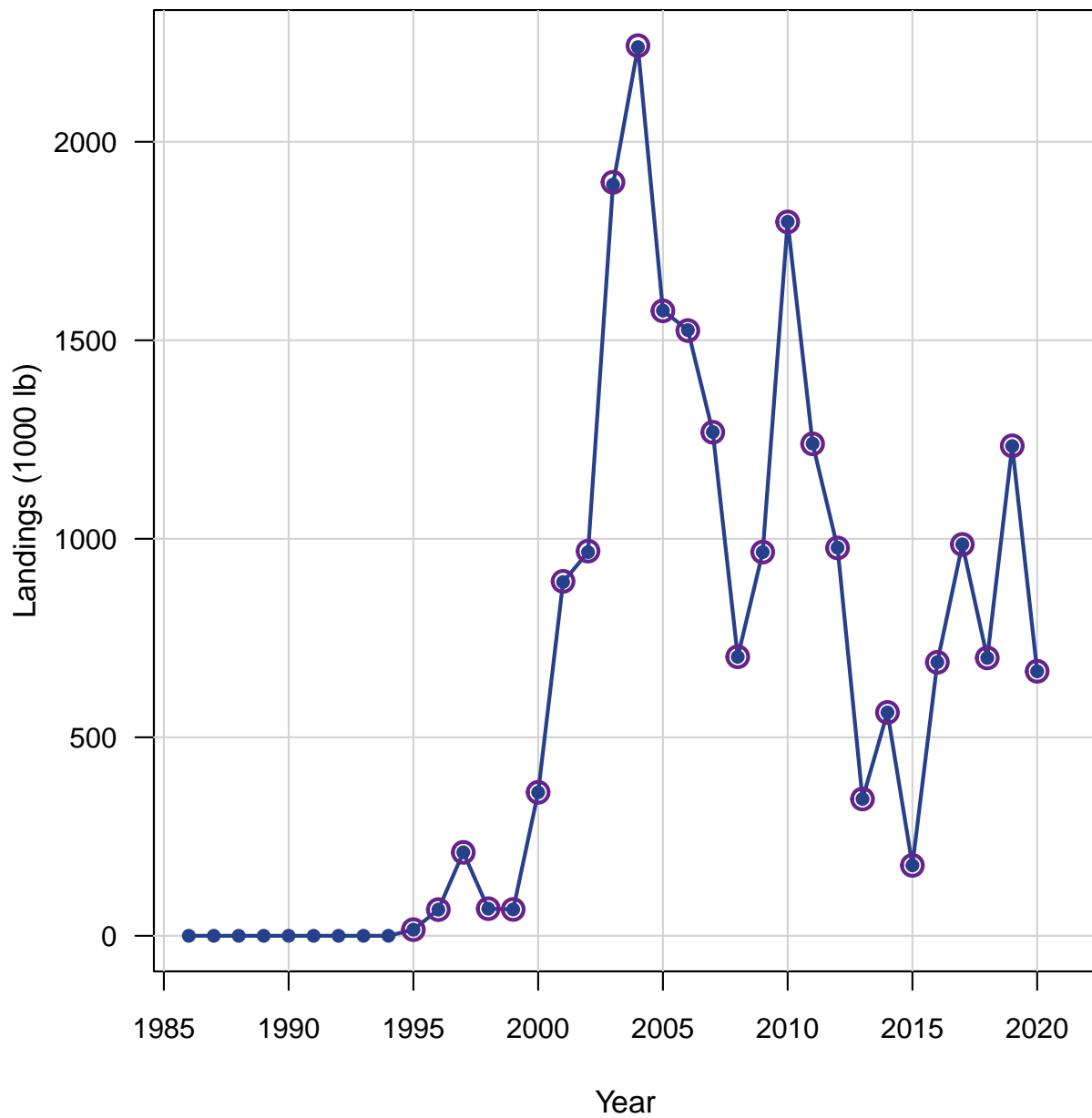


Figure 8. Observed (open circles) and estimated (line, solid circles) recreational landings (1000 fish).

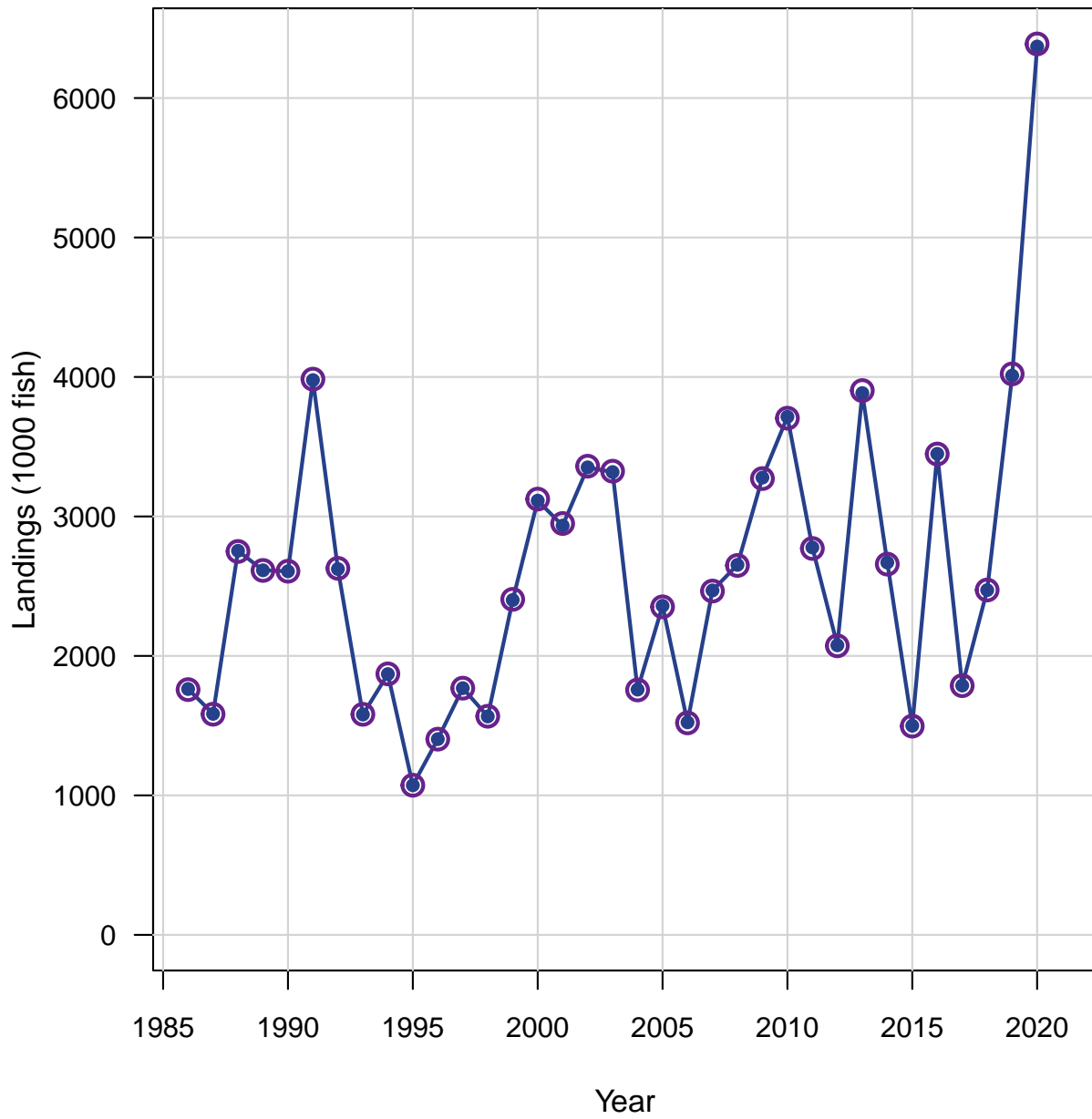


Figure 9. Observed (open circles) and estimated (line, solid circles) recreational discards (1000 fish).

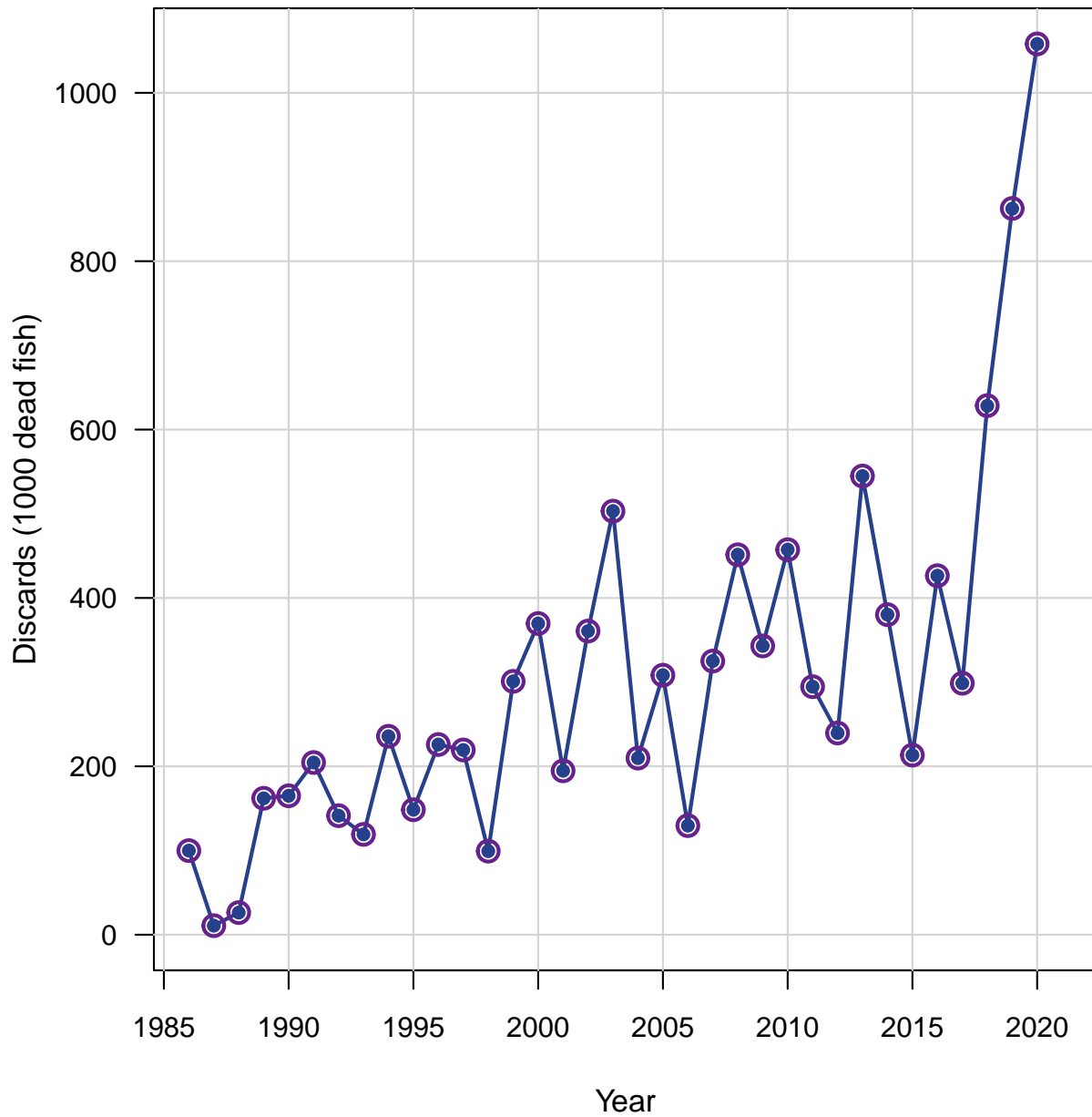


Figure 10. Observed (open circles) and estimated (line, solid circles) discards from shrimp bycatch (1000 fish).

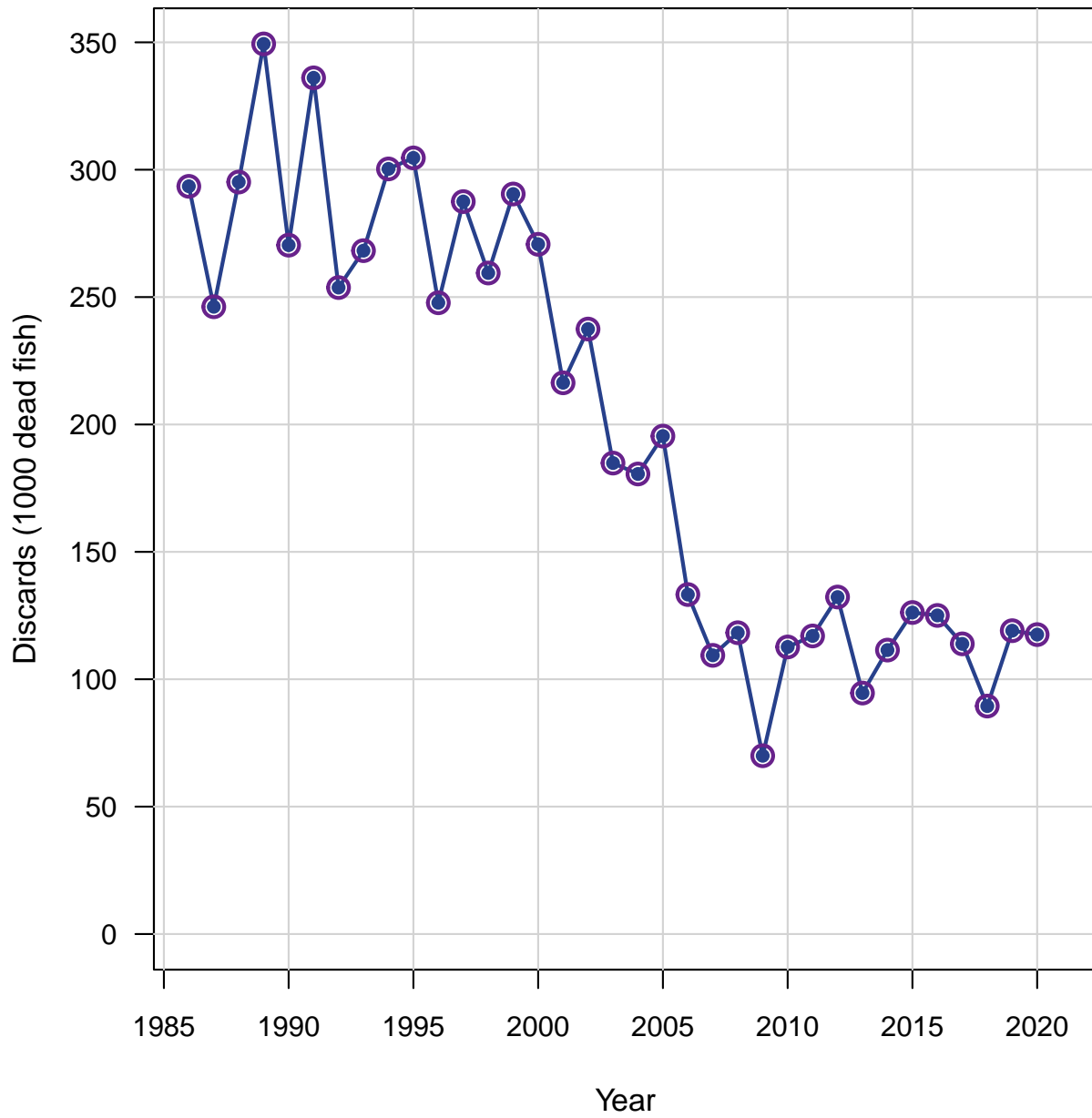


Figure 11. Top Panel: Observed (open circles) and estimated (line, solid circles) index of abundance from Florida commercial handline trip tickets. Bottom panel: Scaled residuals of estimated index of abundance. The model input CVs were modified from the input values by the SDNR weights.

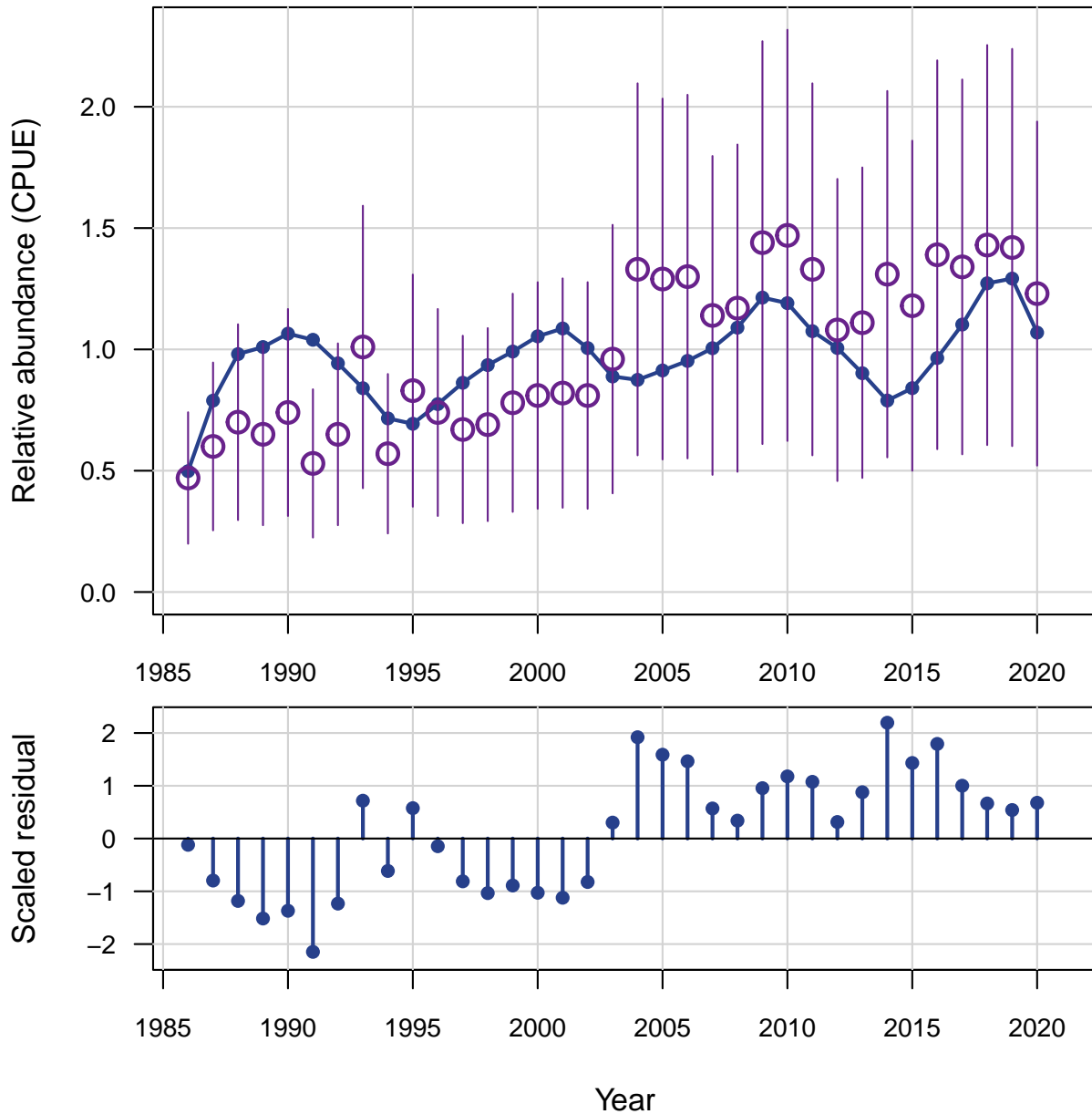


Figure 12. Top Panel: Observed (open circles) and estimated (line, solid circles) index of abundance from MRIP harvested fish. Bottom panel: Scaled residuals of estimated index of abundance. The model input CVs were modified from the input values by the SDNR weights.

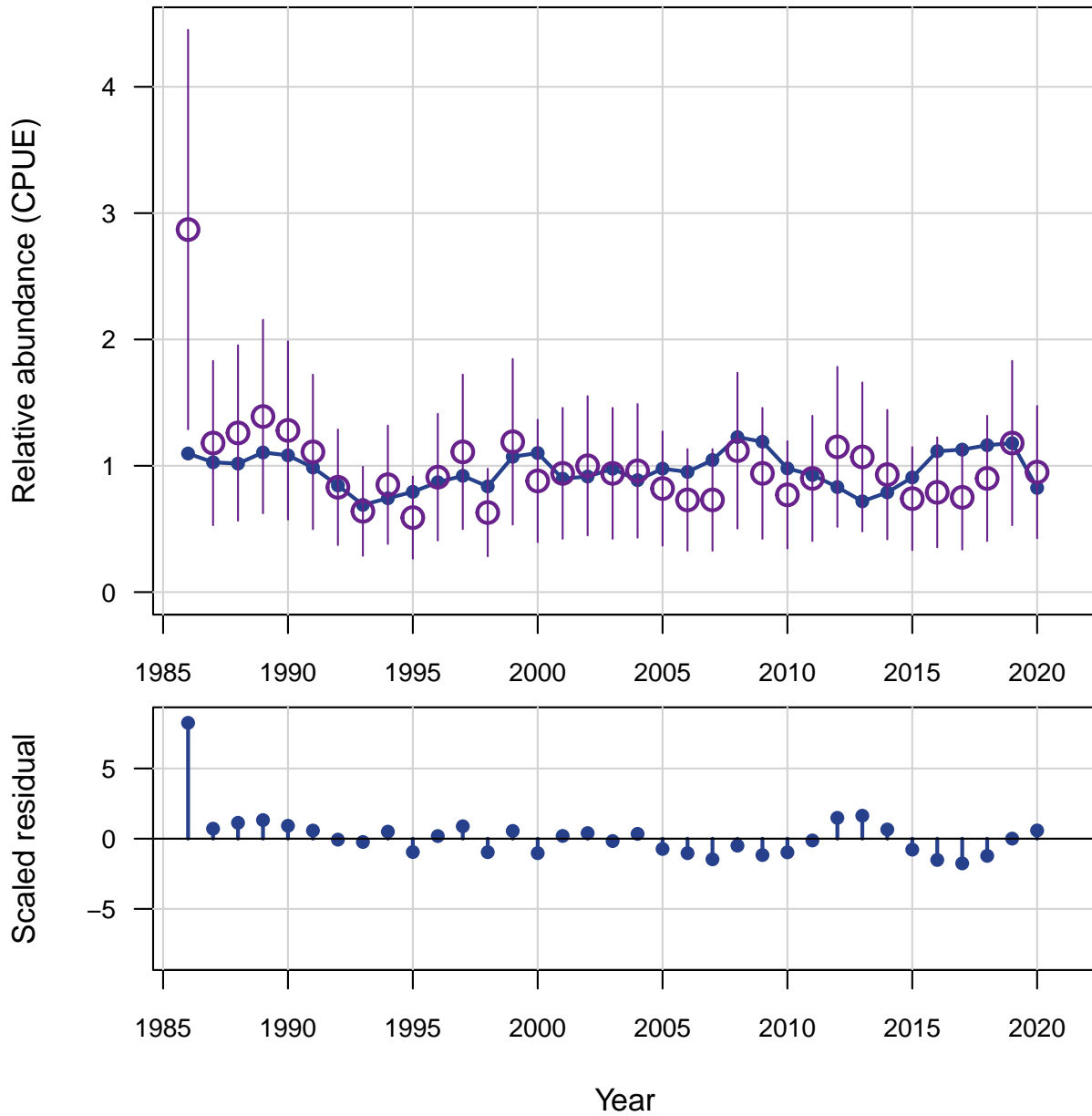


Figure 13. Top Panel: Observed (open circles) and estimated (line, solid circles) index of abundance from SEAMAP YOY samples. Bottom panel: Scaled residuals of estimated index of abundance. The model input CVs were modified from the input values by the SDNR weights.

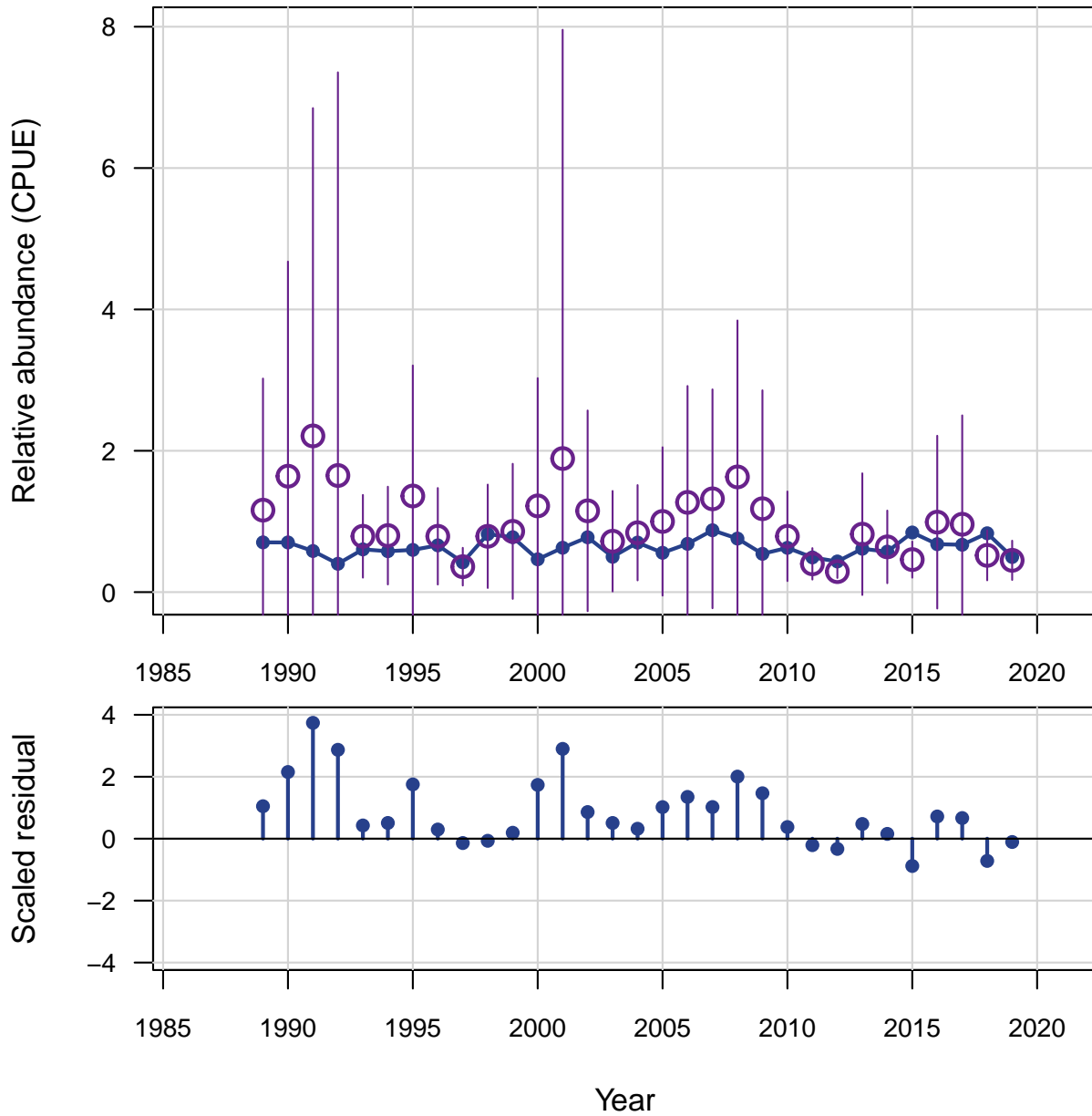


Figure 14. Estimated abundance at age at start of year.

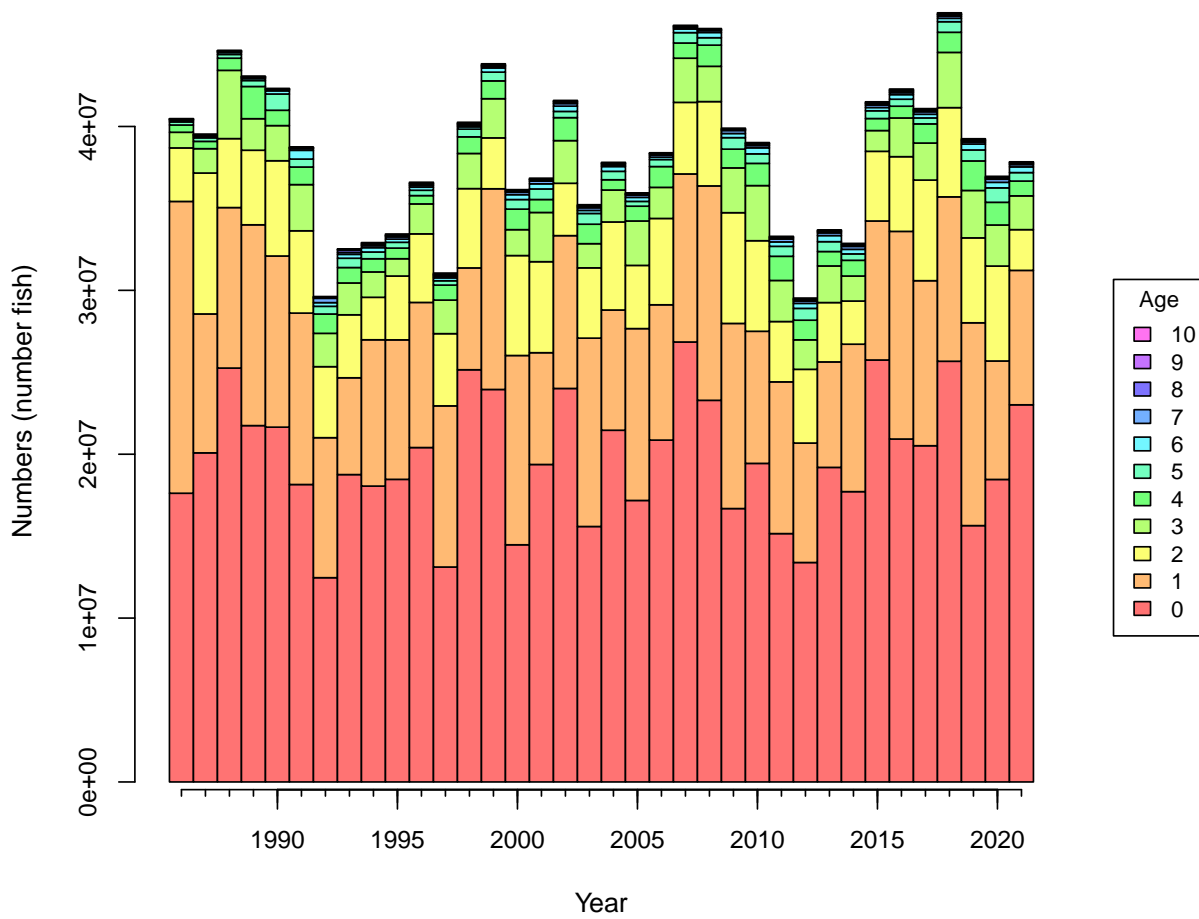


Figure 15. Top panel: Estimated recruitment of age-0 fish. Horizontal dashed line indicates R_{MSY} . Bottom panel: log recruitment residuals.

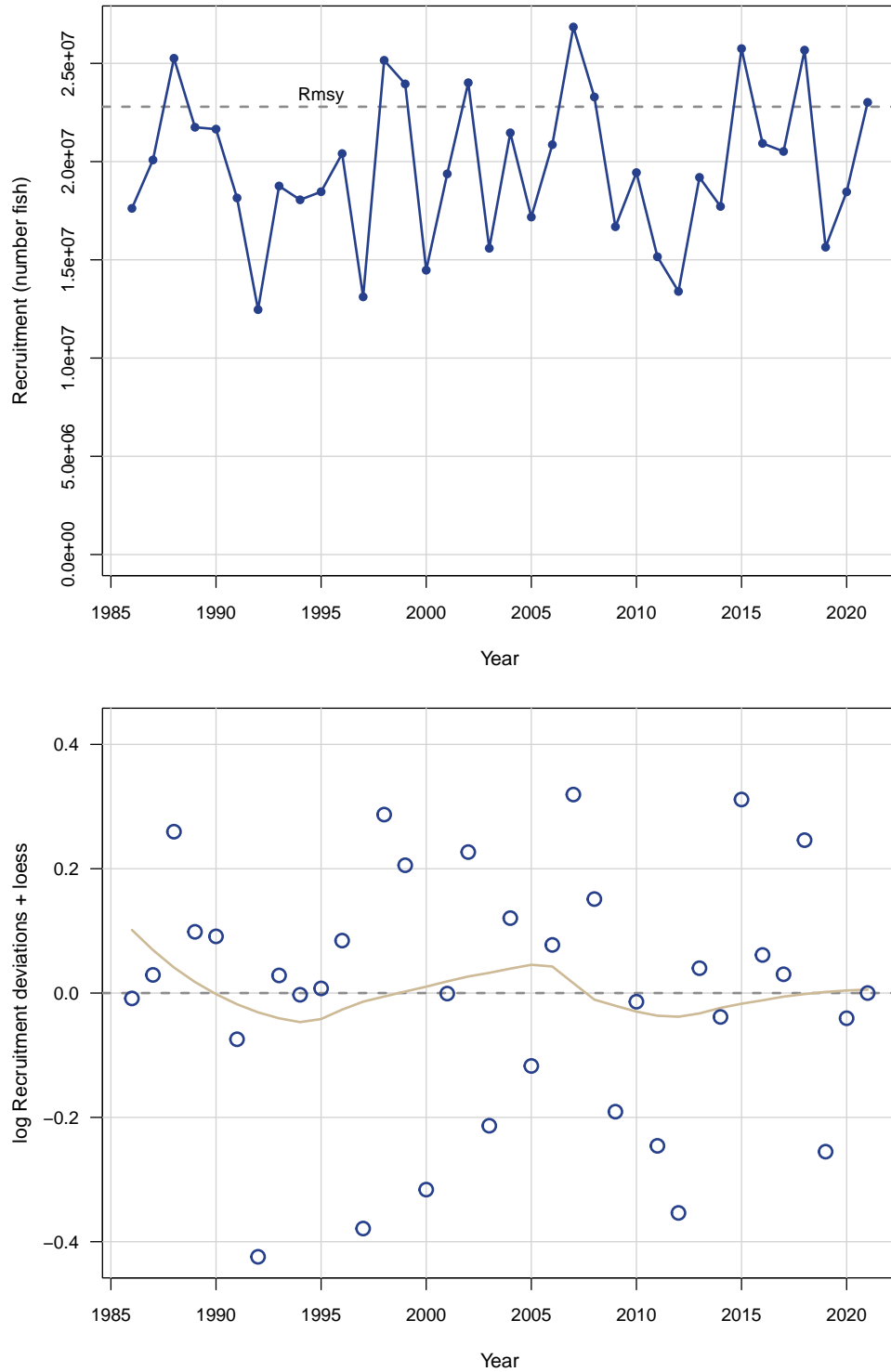


Figure 16. Estimated biomass at age at start of year.

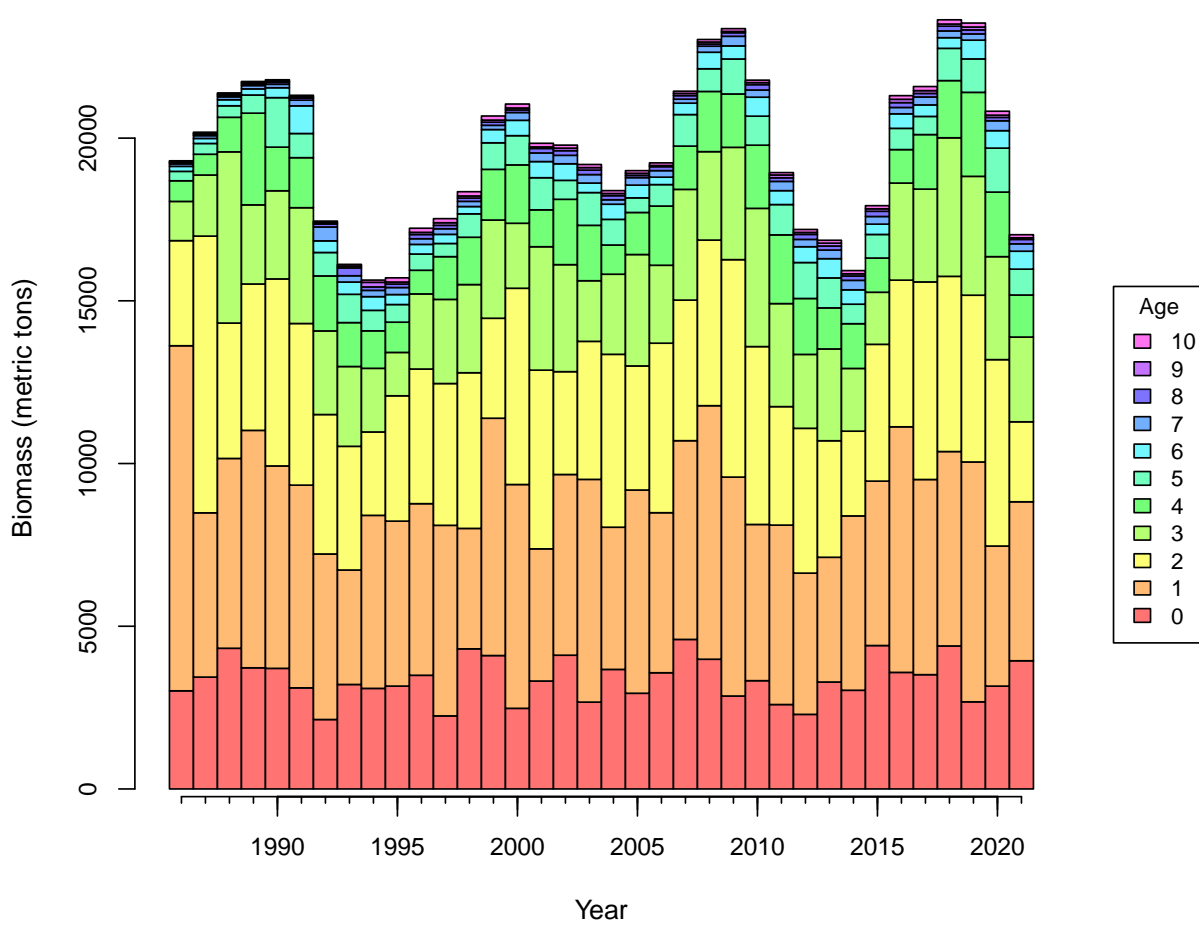


Figure 17. Selectivity of commercial handline fleet for all years in the model. Year indicates start year of the model.

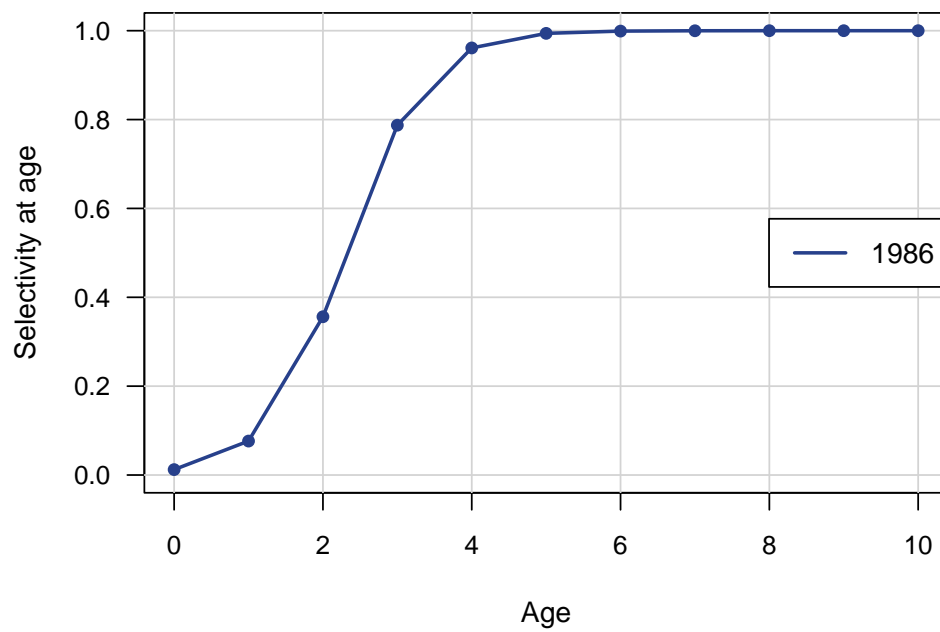


Figure 18. Selectivity of commercial pound net fleet for all years in the model. Year indicates start year of the model.

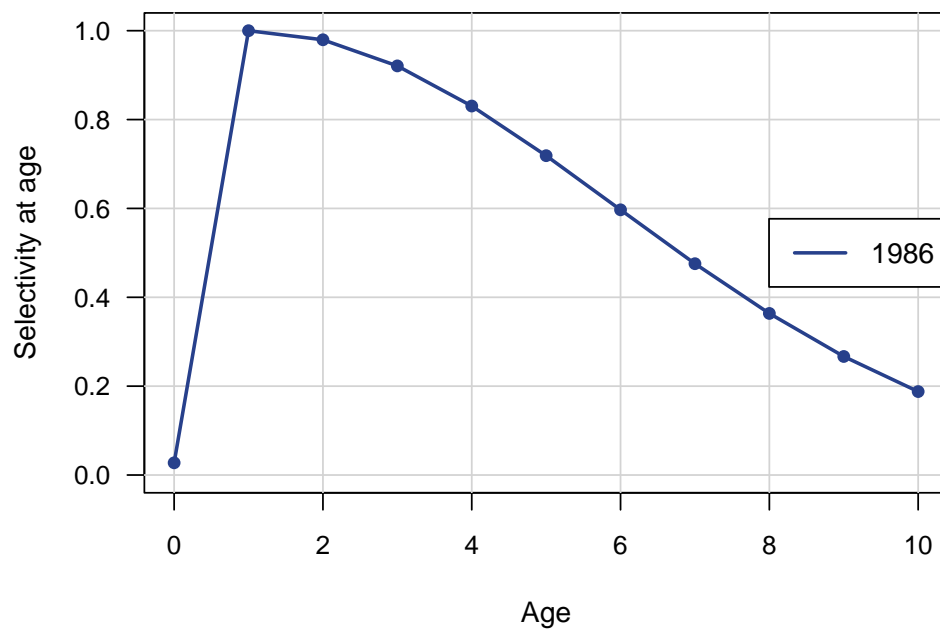


Figure 19. Selectivity of commercial gillnet fleet for all years in the model. Year indicates start year of the model.

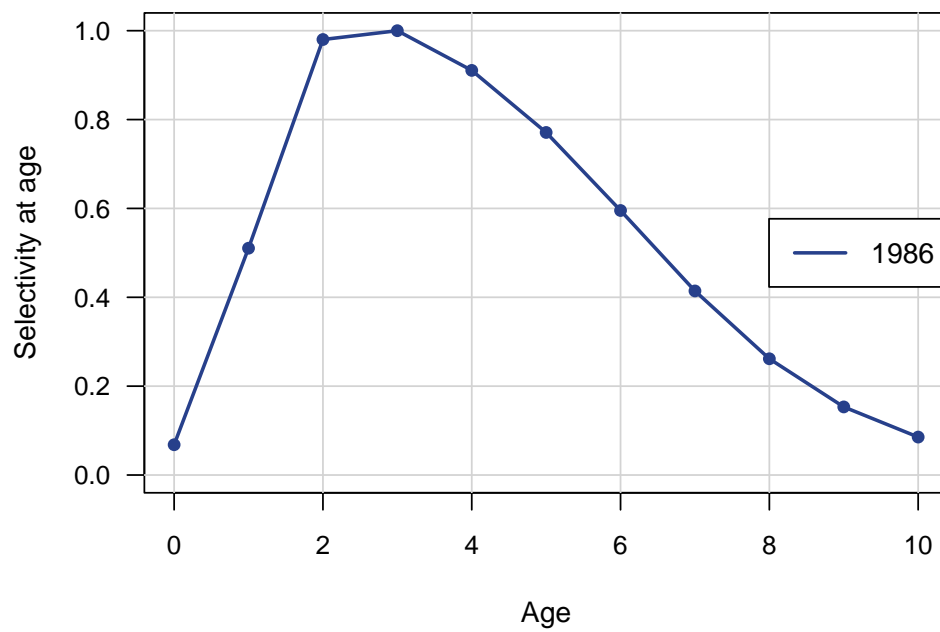


Figure 20. Selectivities of commercial cast net fleet for all years in the model. Year indicates start year of the model.

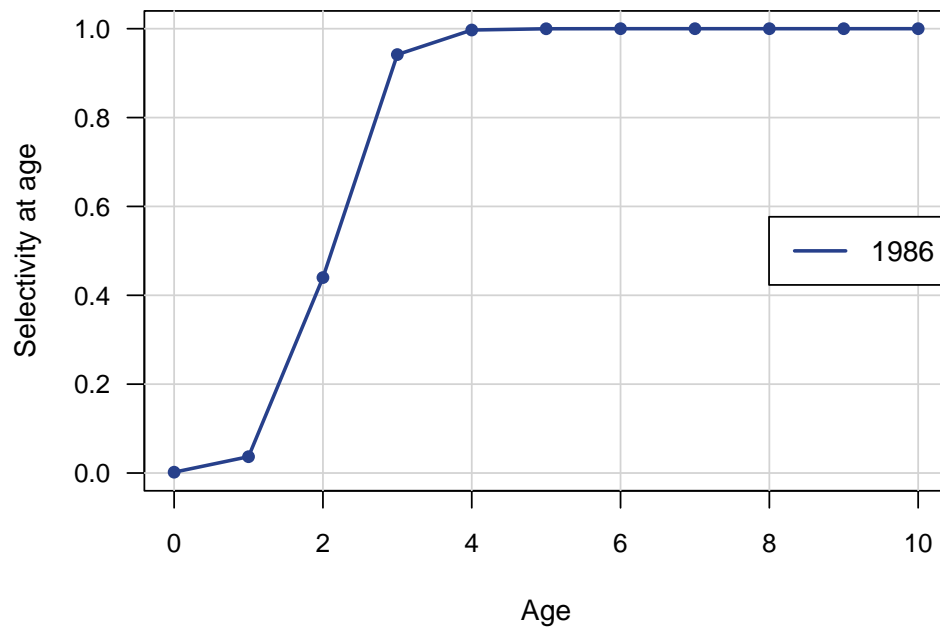


Figure 21. Selectivities of general recreational fishery for all years in the model. Year indicates start year of the model.

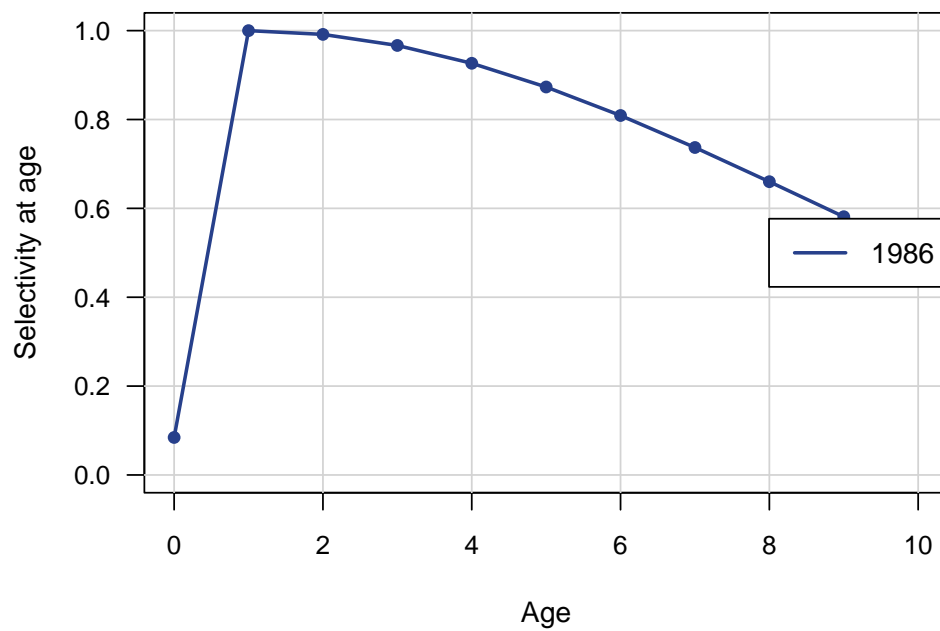


Figure 22. Selectivities of recreational discard for all years in the model. Year indicates start year of the model.

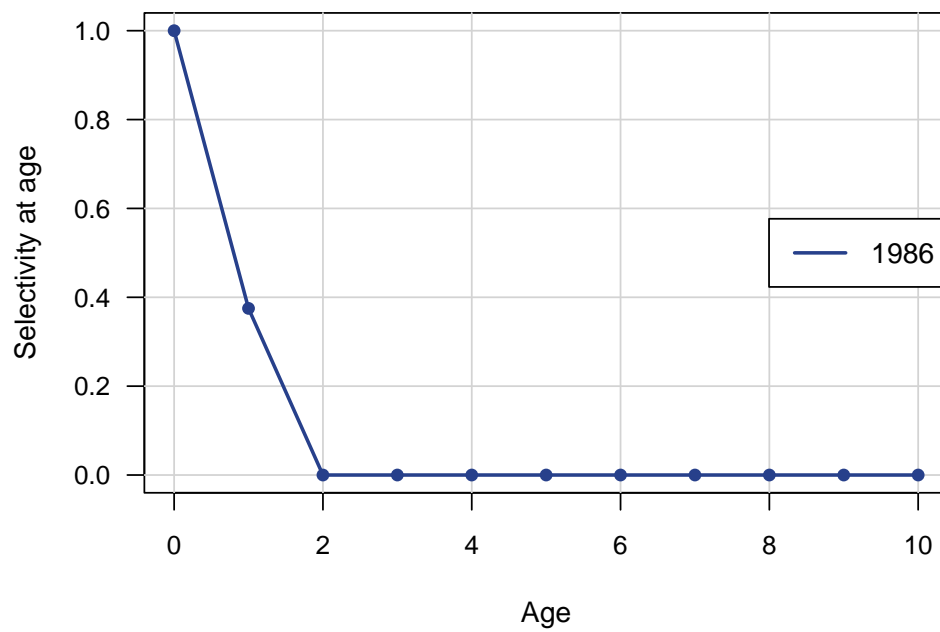


Figure 23. Selectivities of shrimp fishery discard for all years in the model. Year indicates start year of the model.

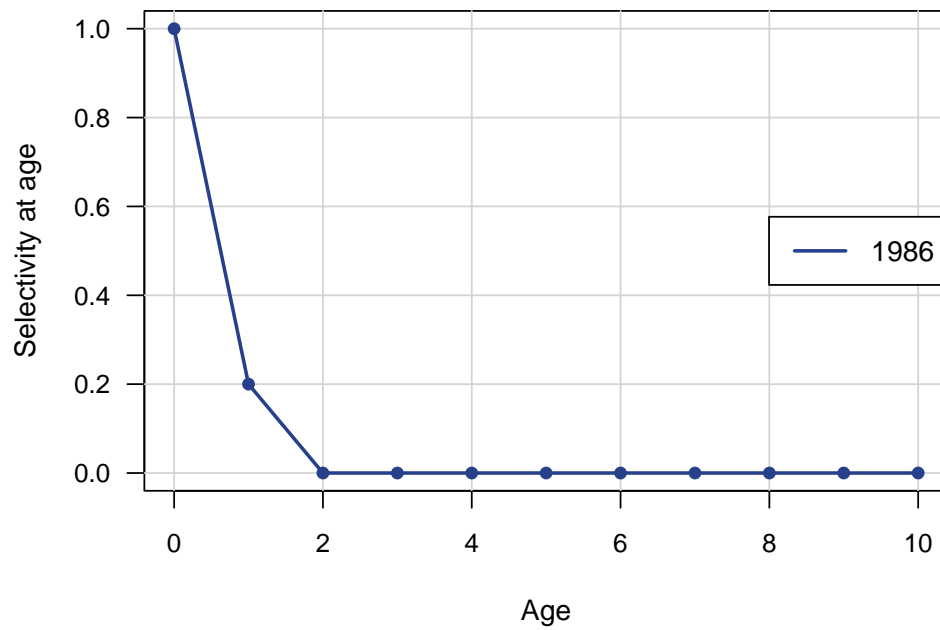


Figure 24. Average selectivity from the terminal assessment year weighted by geometric mean F 's from the last three assessment years for landings (top panel) and discards (bottom panel), and used in computation of benchmarks and central-tendency projections.

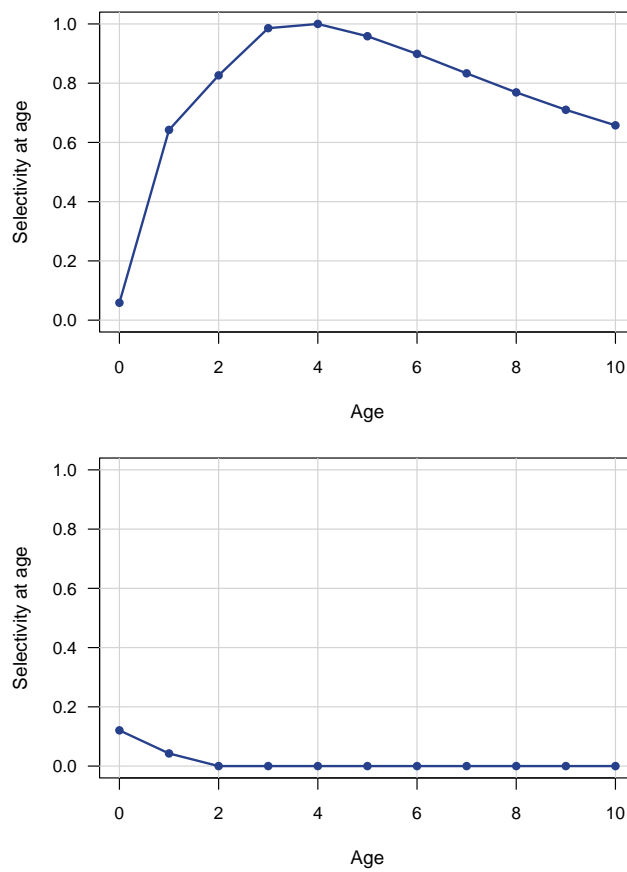


Figure 25. Estimated fully selected fishing mortality rate (per year) by fishery. *cH* refers to commercial handline, *cP* to commercial pound net, *cG* to commercial gill net, *cC* to commercial cast net, *GR* for recreational, *GR.D* for recreational discards, and *SB.D* for shrimp bycatch. Full *F*, the maximum *F* at age summed across fleets, may not equal the sum of fully selected *F*'s because of dome-shaped selectivities.

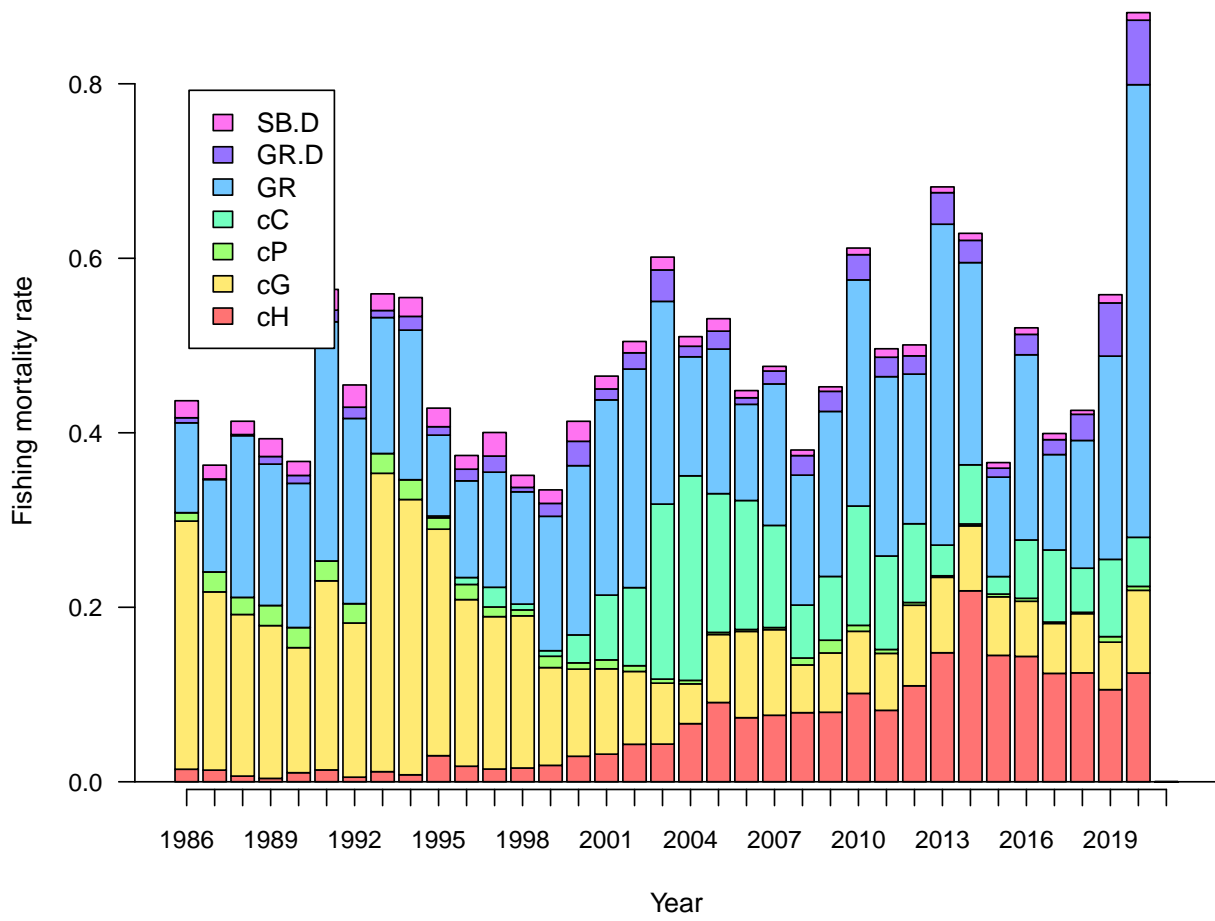


Figure 26. Alternative measures of fishing intensity. Top panel shows equilibrium SPR conditional on annual F , with a reference line at equilibrium MSY. Bottom panel shows exploitation rate (E) computed as number killed divided total abundance (thick black curve), which can be divided into its components of landings (thin green curve) and dead discards (thin blue curve).

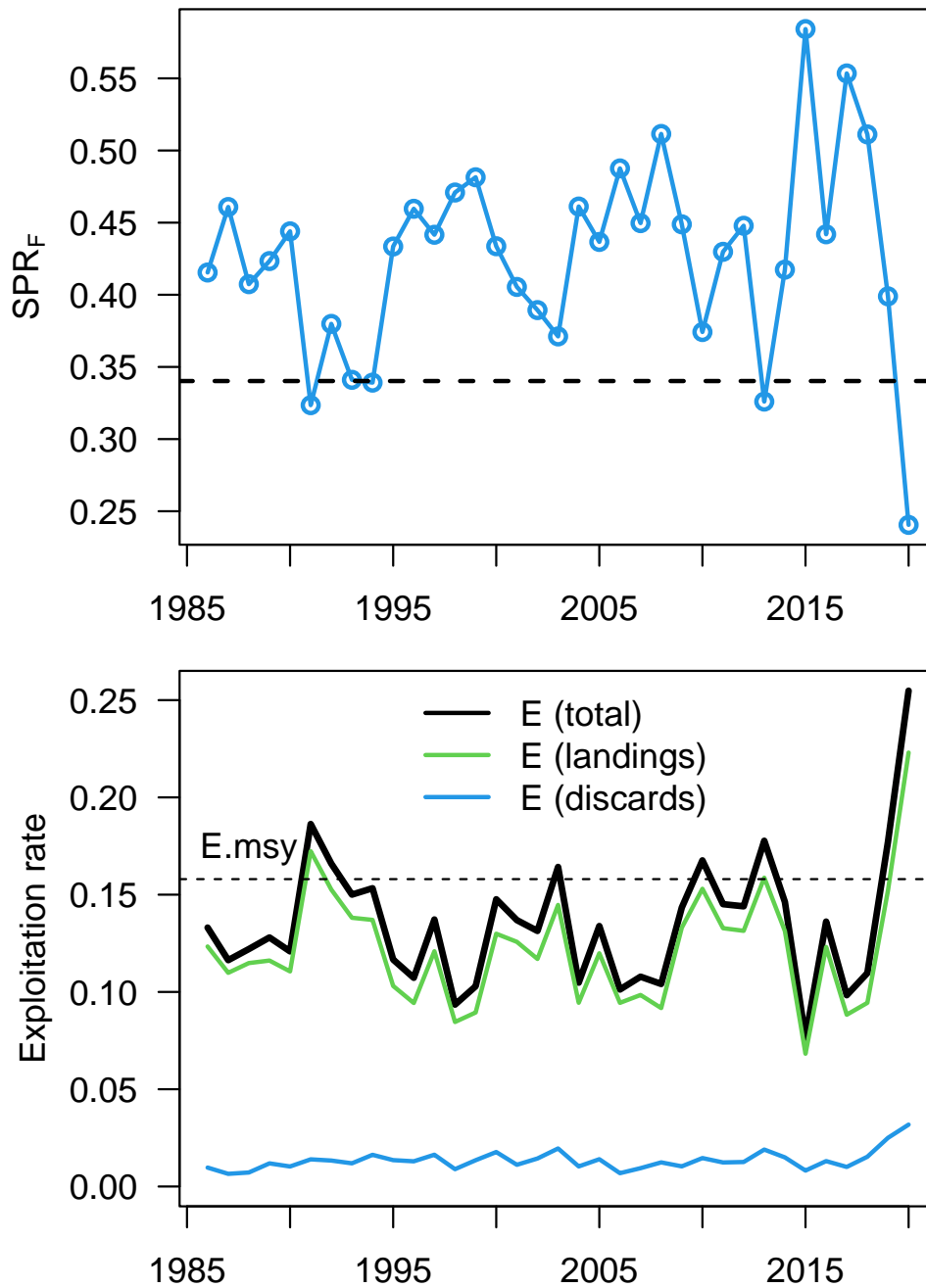


Figure 27. Estimated landings in numbers by fishery from the catch-age model. *cH* refers to commercial handline, *cP* to commercial pound net, *cG* to commercial gill net, *cC* to commercial cast net, and *GR* for recreational.

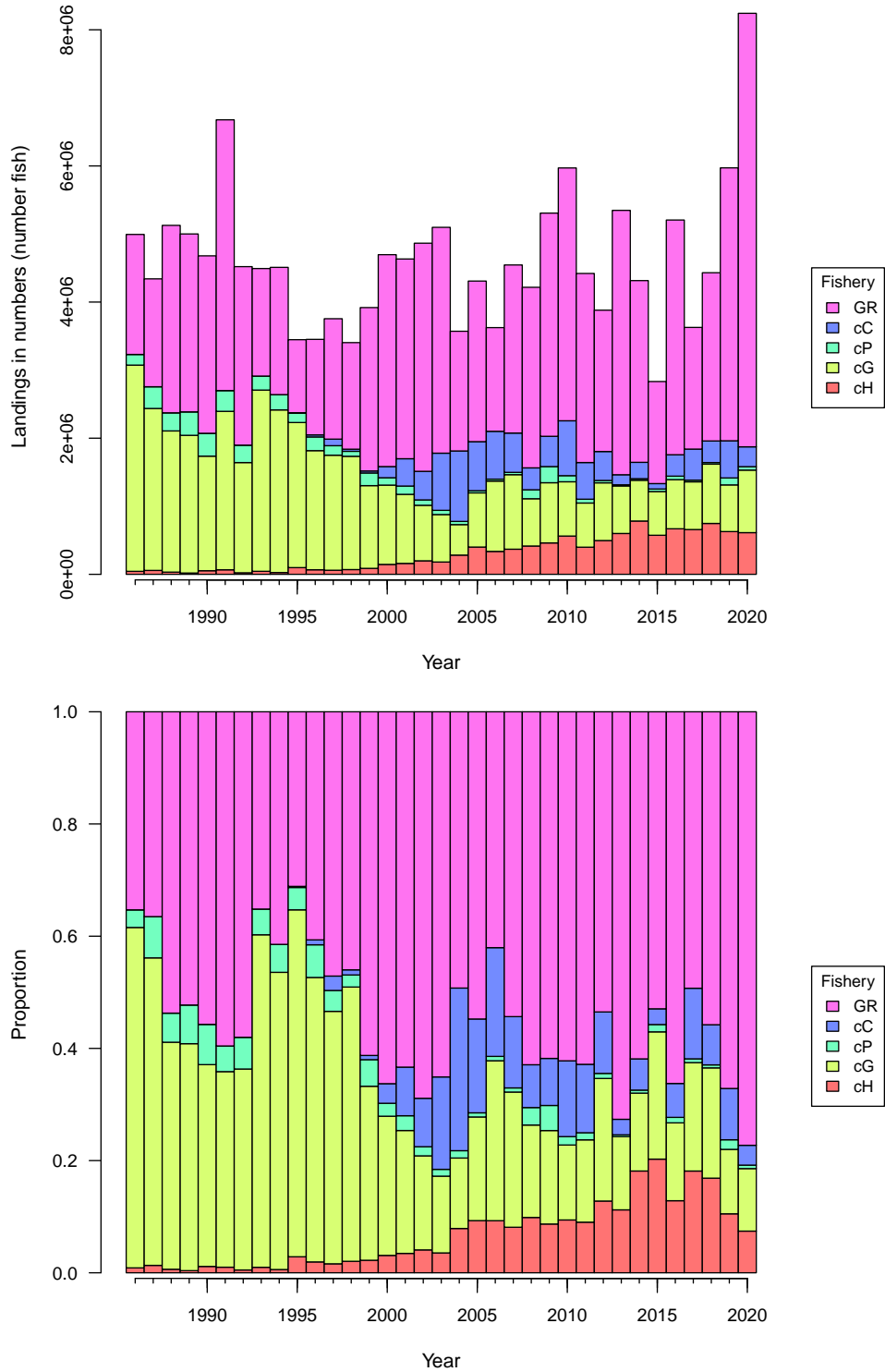


Figure 28. Estimated landings in whole weight by fishery from the catch-age model. *cH* refers to commercial hand-line, *cP* to commercial pound net, *cG* to commercial gill net, *cC* to commercial cast net, and *GR* for recreational. Horizontal dashed line in the top panel corresponds to the point estimate of *MSY*.

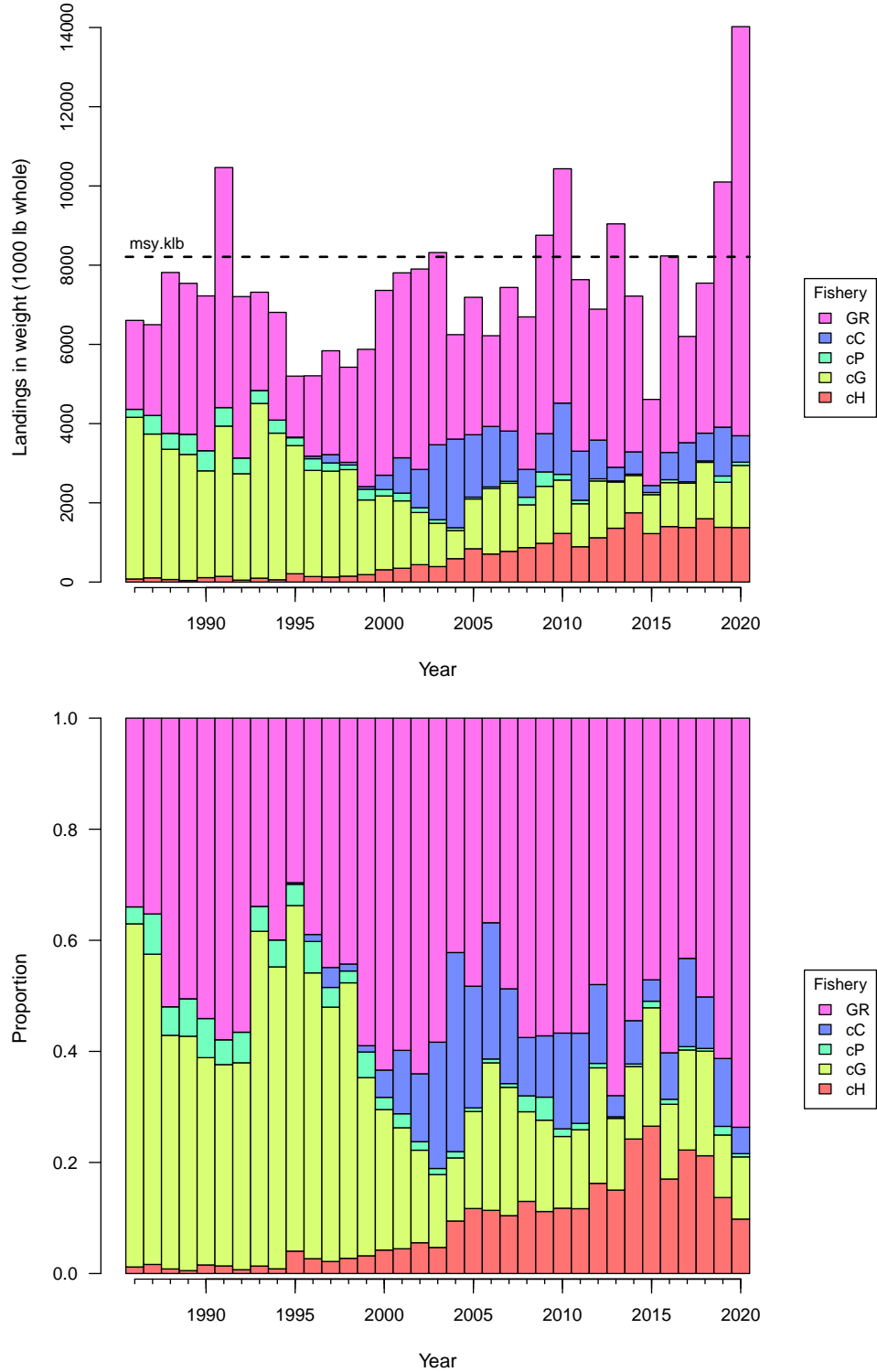


Figure 29. Estimated discards in numbers by fishery from the catch-age model. SB refers to shrimp bycatch, and GR for recreational.

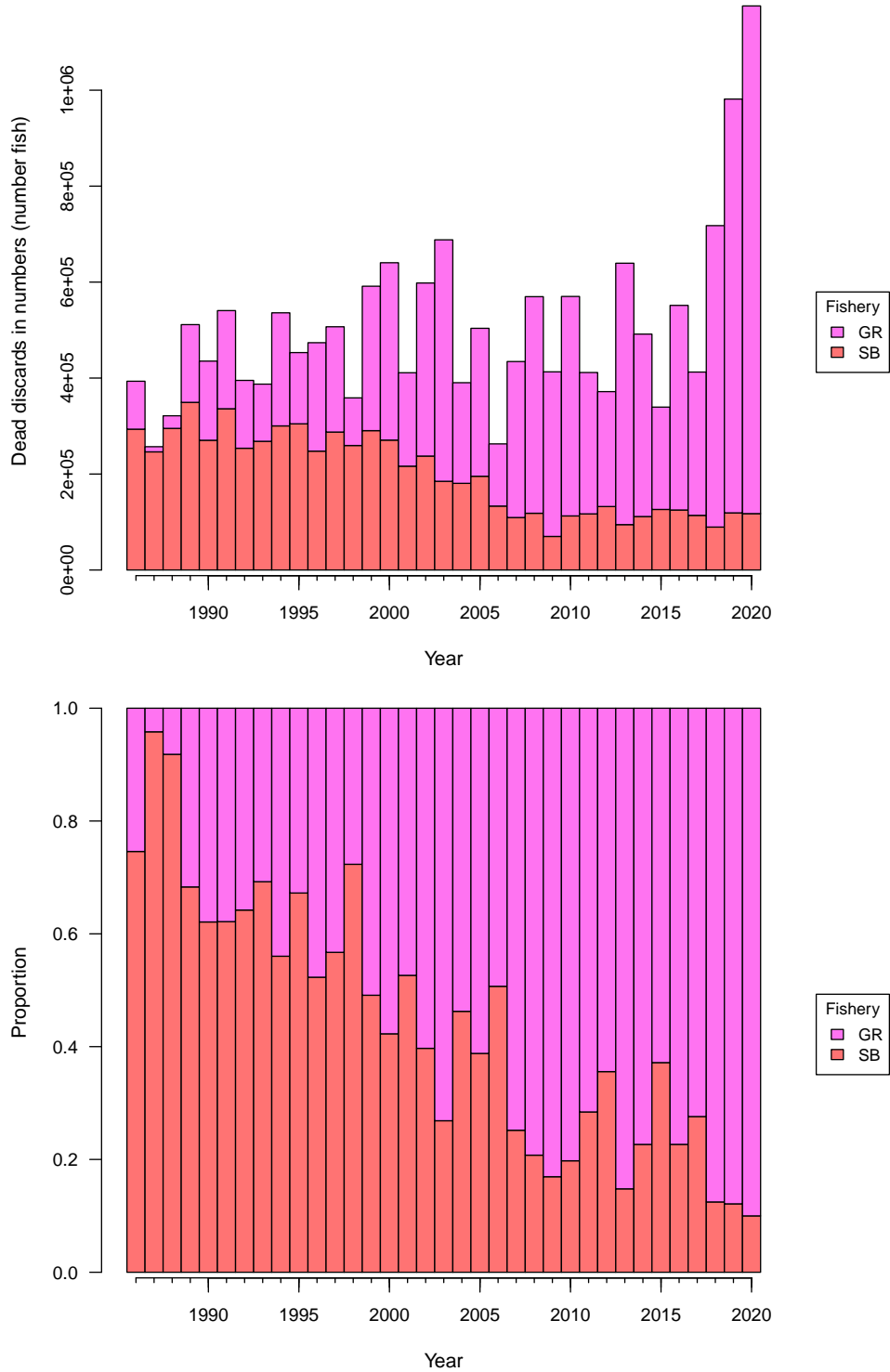


Figure 30. Estimated discards in whole weight by fishery from the catch-age model. SB refers to shrimp bycatch, and GR for recreational.

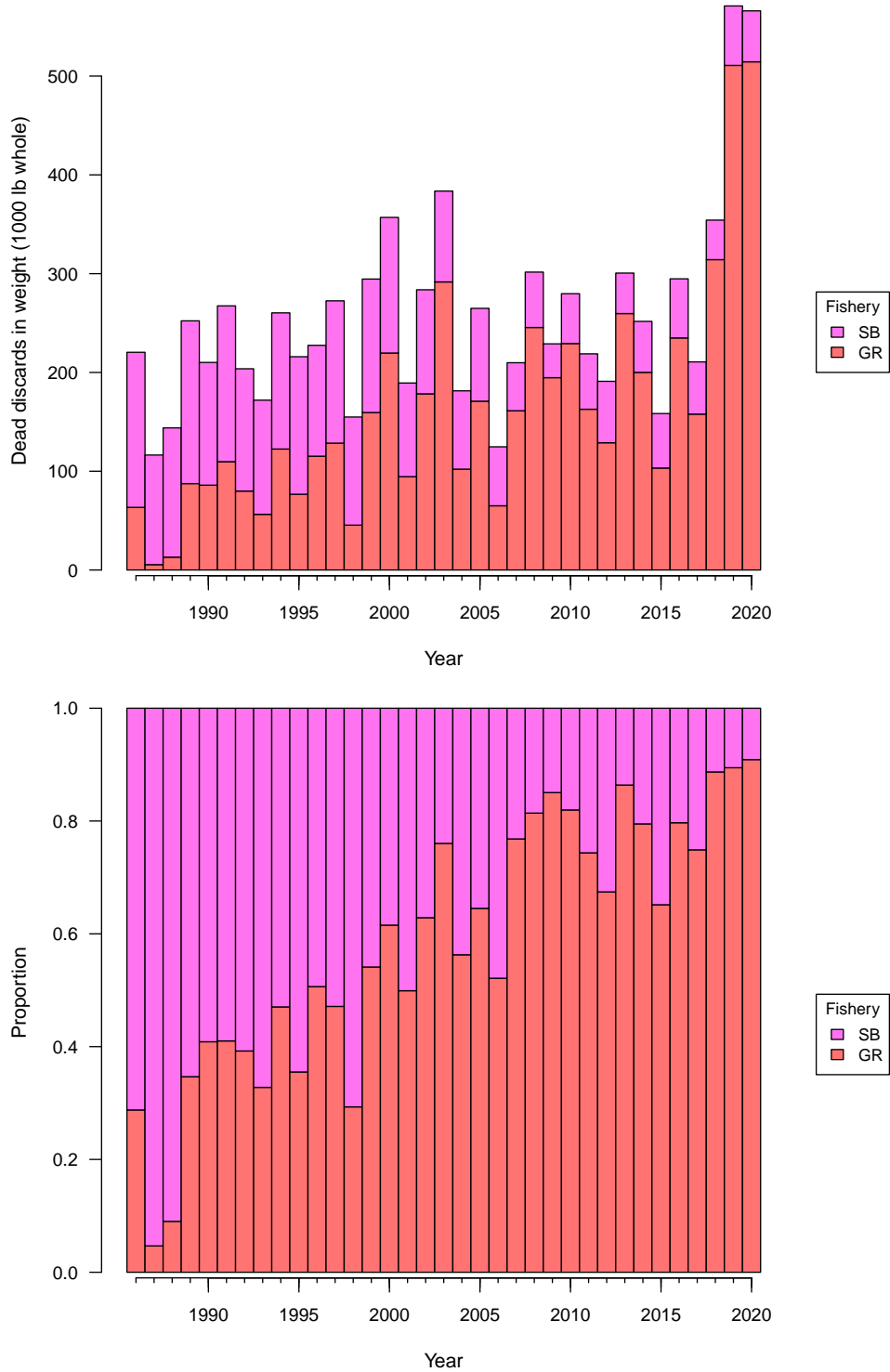


Figure 31. Top panel: Beverton–Holt spawner-recruit curves, with and without lognormal bias correction. The expected (upper) curve was used for computing management benchmarks. Years within panel indicate year of recruitment generated from spawning biomass one year prior. Bottom panel: log of recruits (number age-0 fish) per spawner (mature female gonad weight) as a function of spawners.

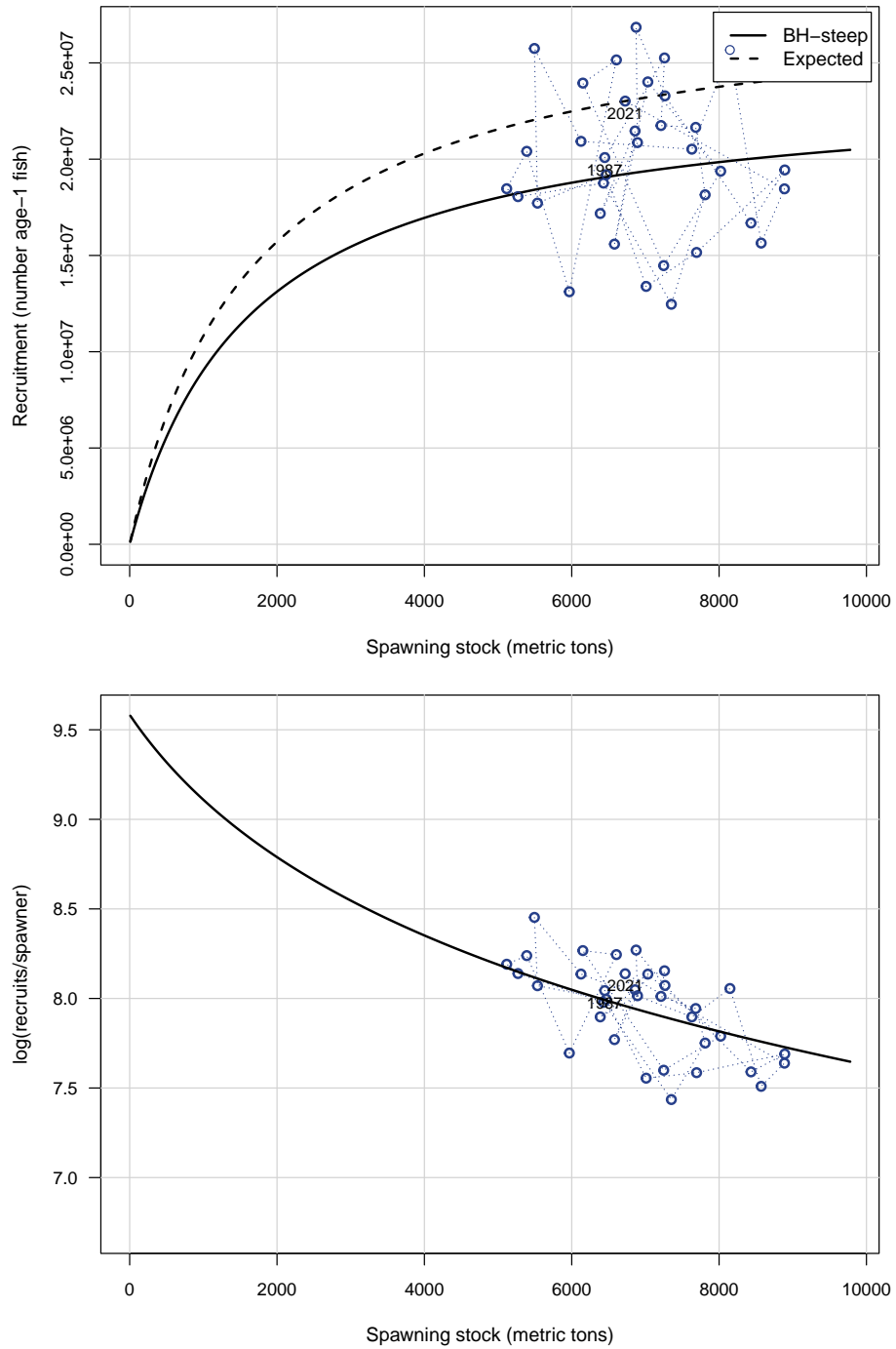


Figure 32. Probability densities of spawner-recruit quantities: Mean recruits (R_0 , age-0 fish), median recruits, and unfished spawners per recruit. Solid vertical lines represent point estimates or values from the base run of the Beaufort Assessment Model; dashed vertical lines represent medians from the MCBE runs.

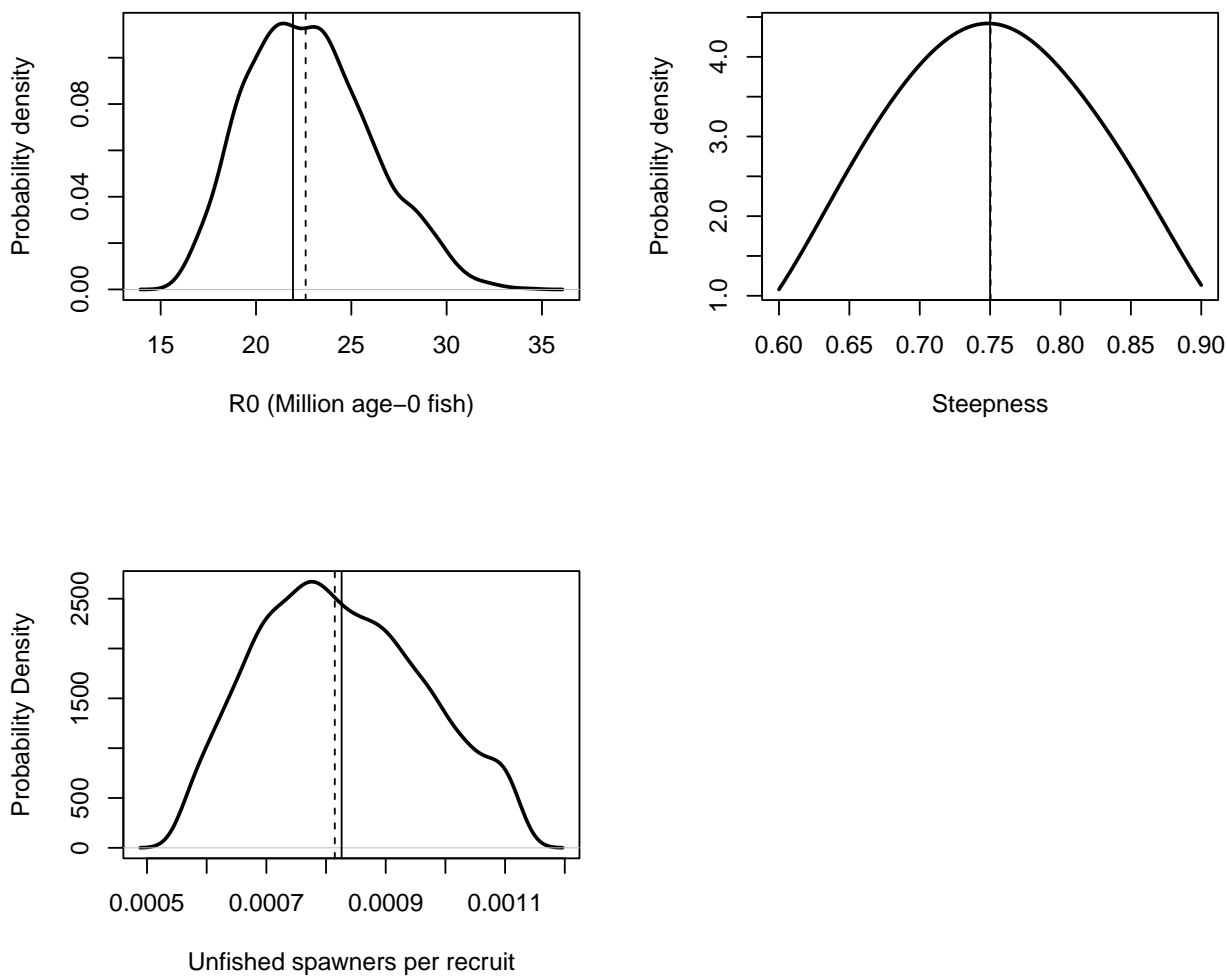


Figure 33. Top panel: yield per recruit. Bottom panel: spawning potential ratio (spawning biomass per recruit relative to that at the unfished level), from which the $y\%$ levels provide $F_{y\%}$. Current F (F_{cur}) is the geometric mean full F from the last 3 years of the assessment. Both curves are based on average selectivity from the end of the assessment period.

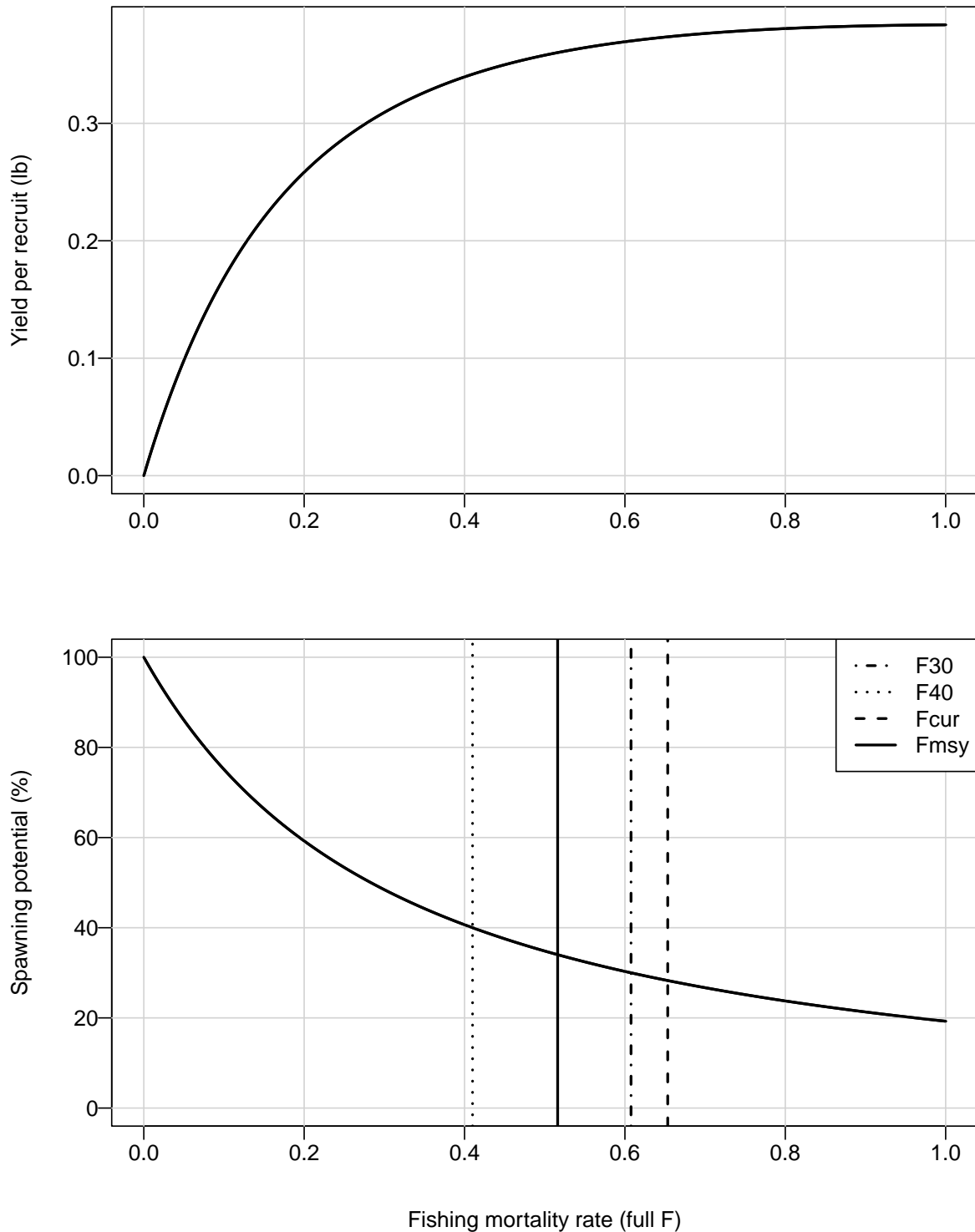


Figure 34. Top panel: equilibrium landings. The peak occurs where fishing rate is $F_{MSY} = 0.52$ and equilibrium landings are $MSY = 8210.19$ (1000 lb). Bottom panel: equilibrium spawning biomass. Both curves are based on average selectivity from the end of the assessment period.

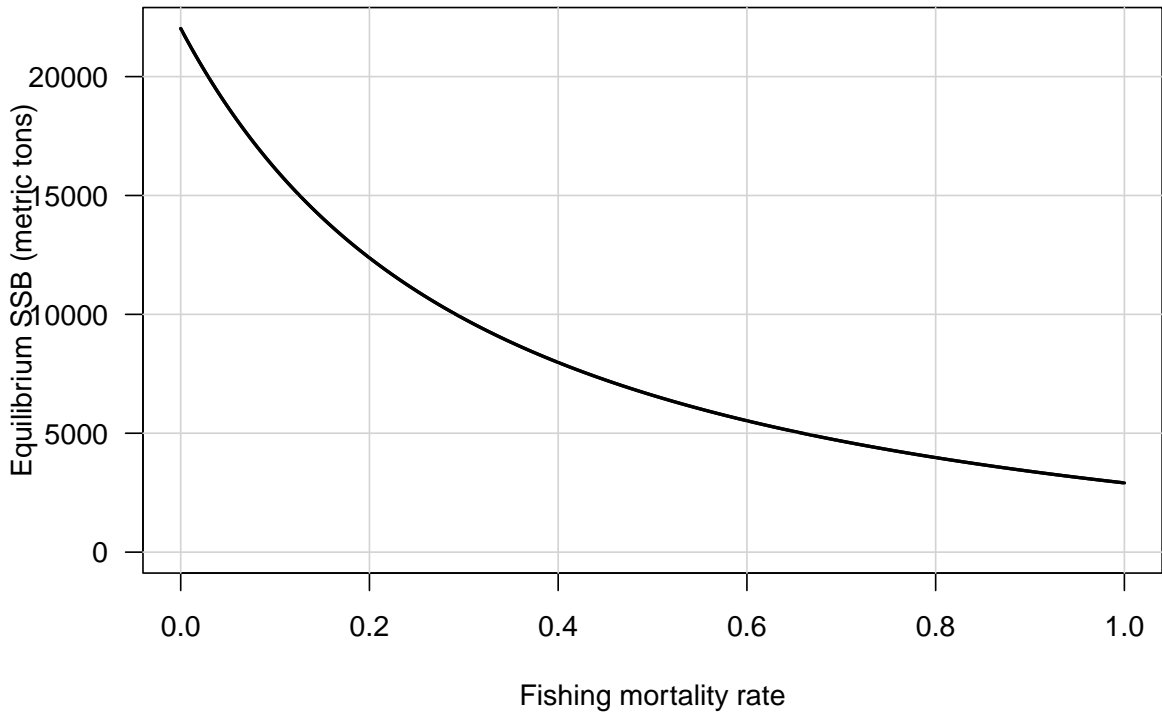
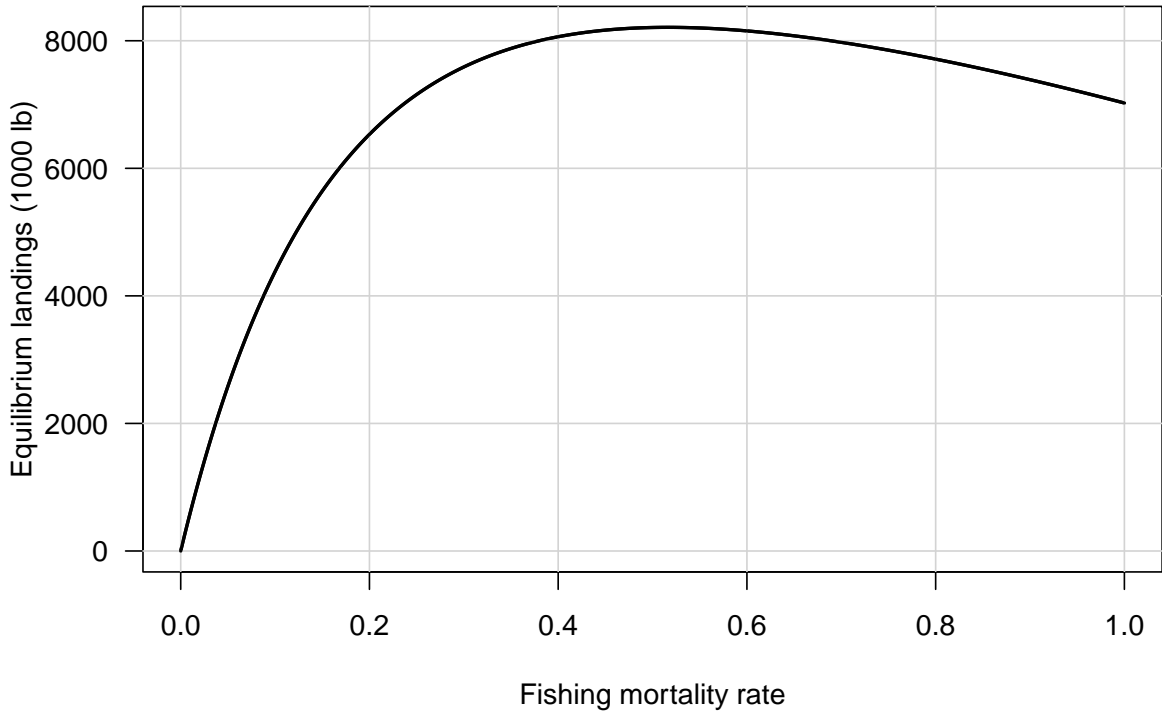


Figure 35. Equilibrium landings as a function of equilibrium biomass, which itself is a function of fishing mortality rate. The peak occurs where equilibrium biomass is $B_{MSY} = 19588.3$ mt and equilibrium landings are $MSY = 8210.19$ (1000 lb).

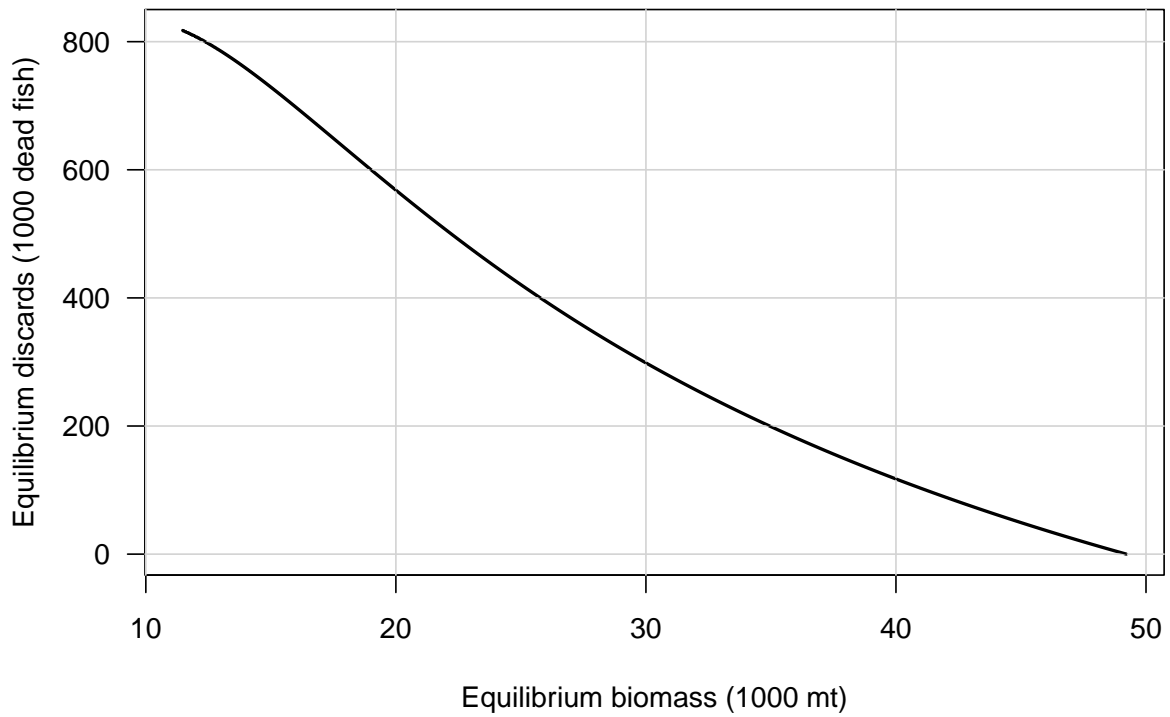
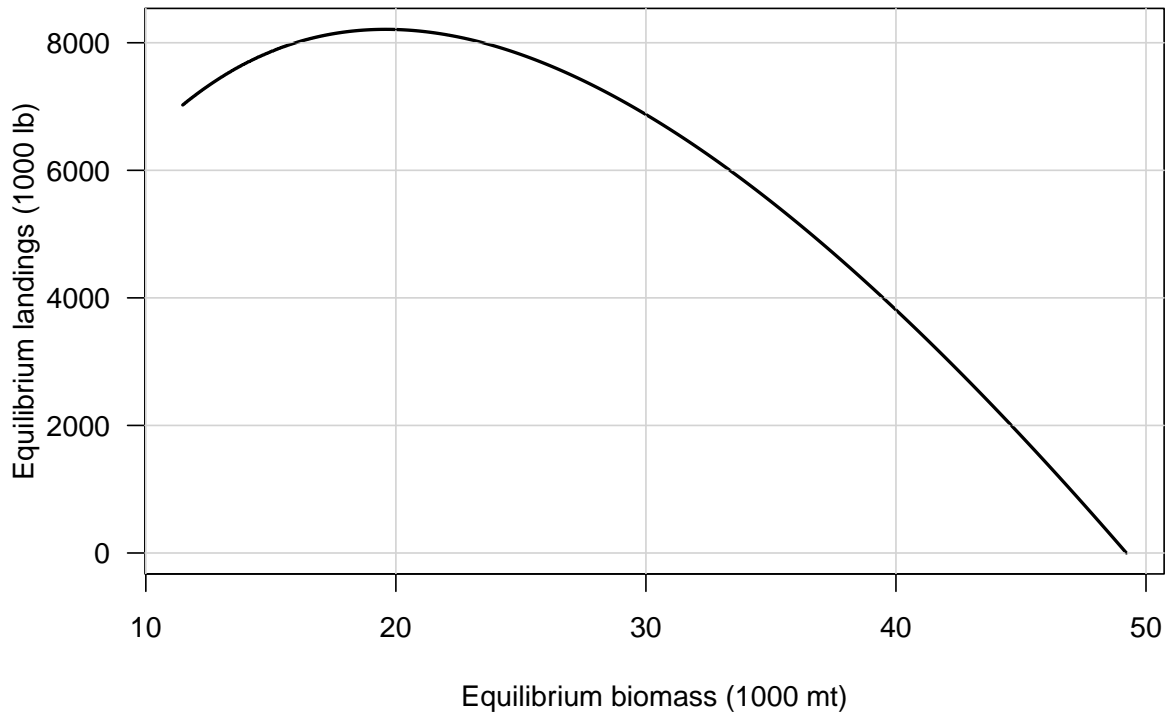


Figure 36. Probability densities of F_{MSY} -related benchmarks from MCB analysis of the Beaufort Assessment Model. Solid vertical line represent point estimates from the base run and the dashed vertical line represent the median of the MCB distribution.

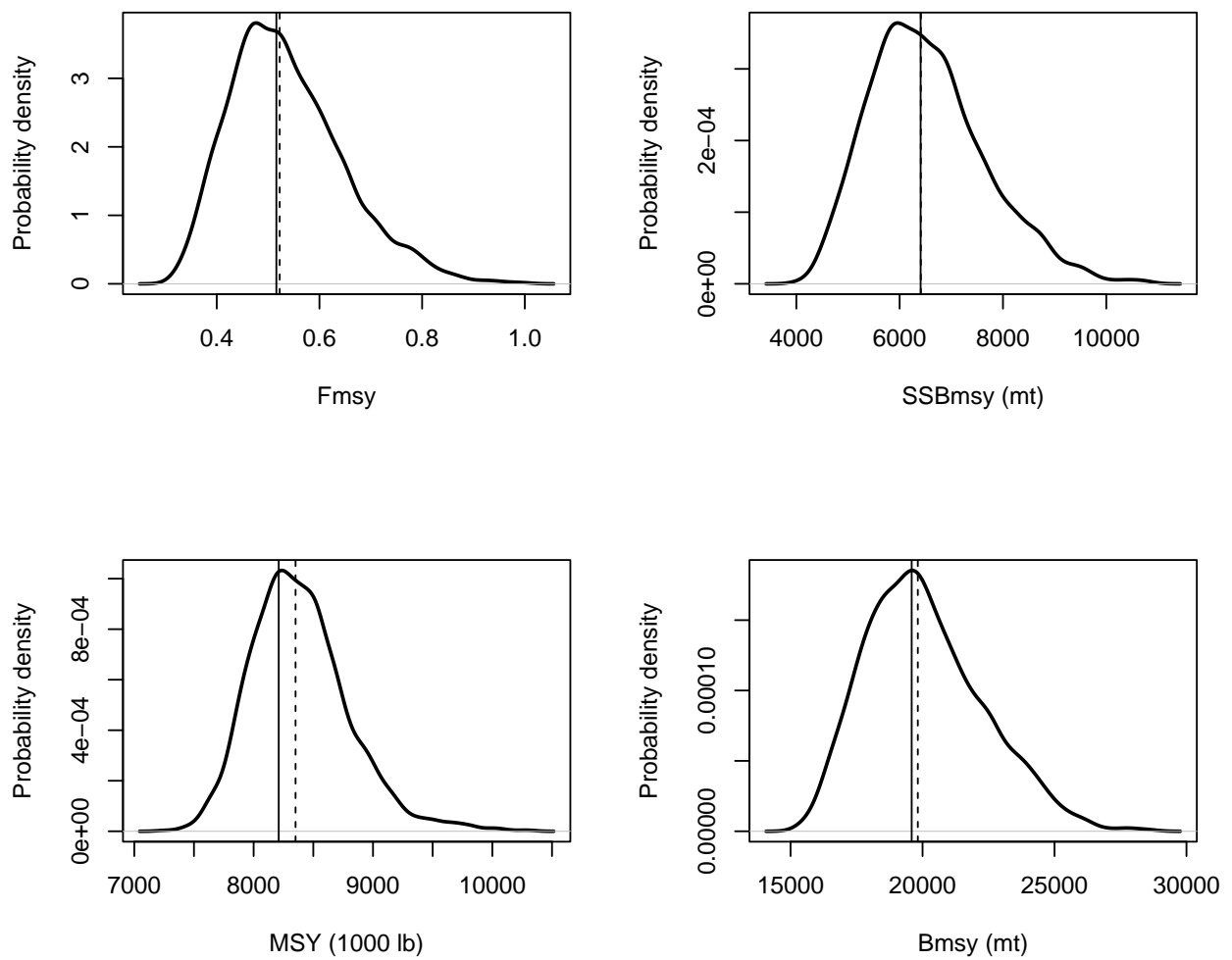


Figure 37. Estimated time series relative to benchmarks. Solid line indicates estimates from base run of the Beaufort Assessment Model; dashed lines indicate the median of the MCB trials; gray error bands indicate 5th and 95th percentiles of the MCB trials. Top panel: spawning biomass relative to the spawning stock biomass at MSY. Bottom panel: F relative to F_{MSY} .

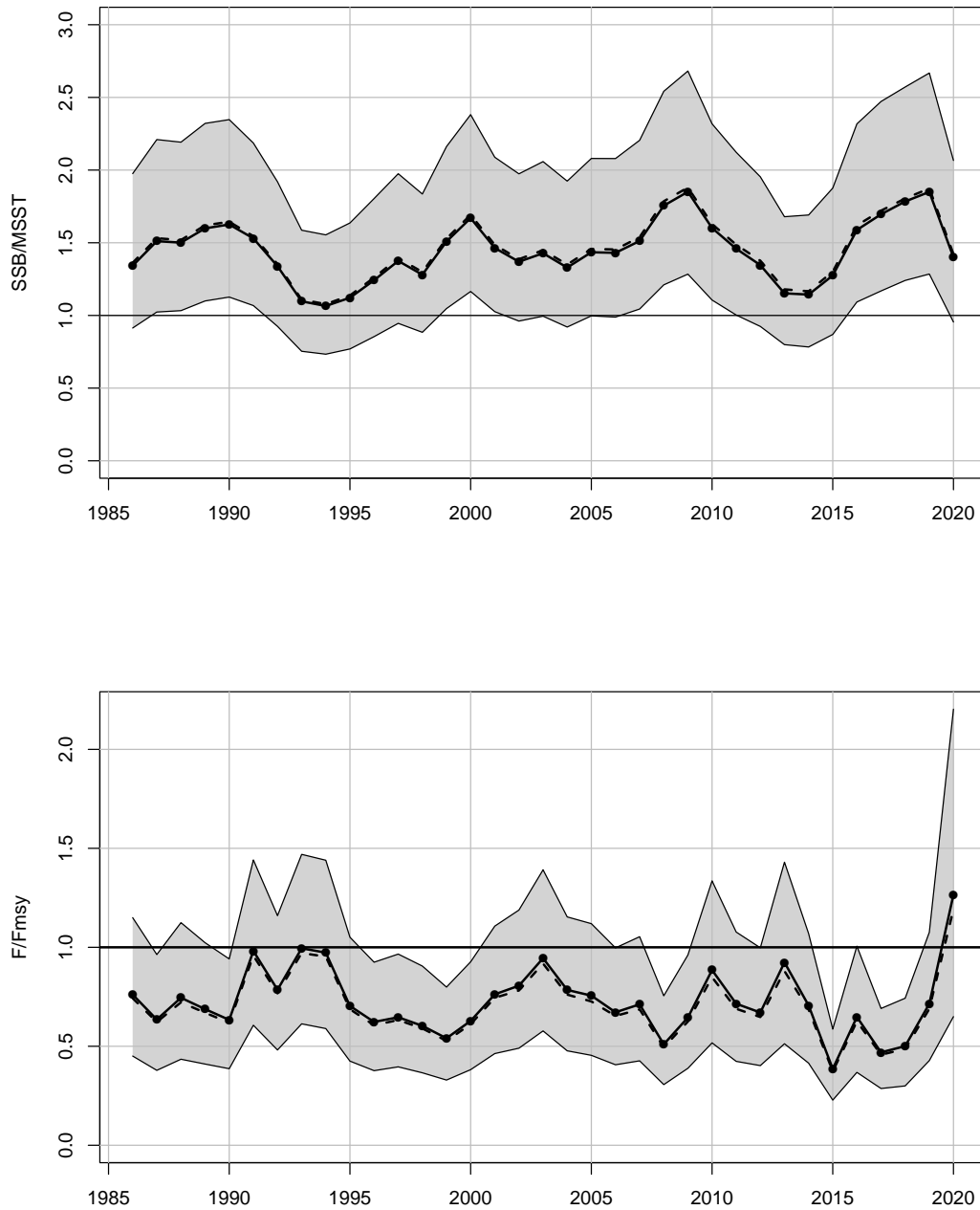


Figure 38. Phase plot of terminal status estimates from MCB analysis of the Beaufort Assessment Model. The intersection of crosshairs indicates estimates from the base run; lengths of crosshairs defined by 5th and 95th percentiles.

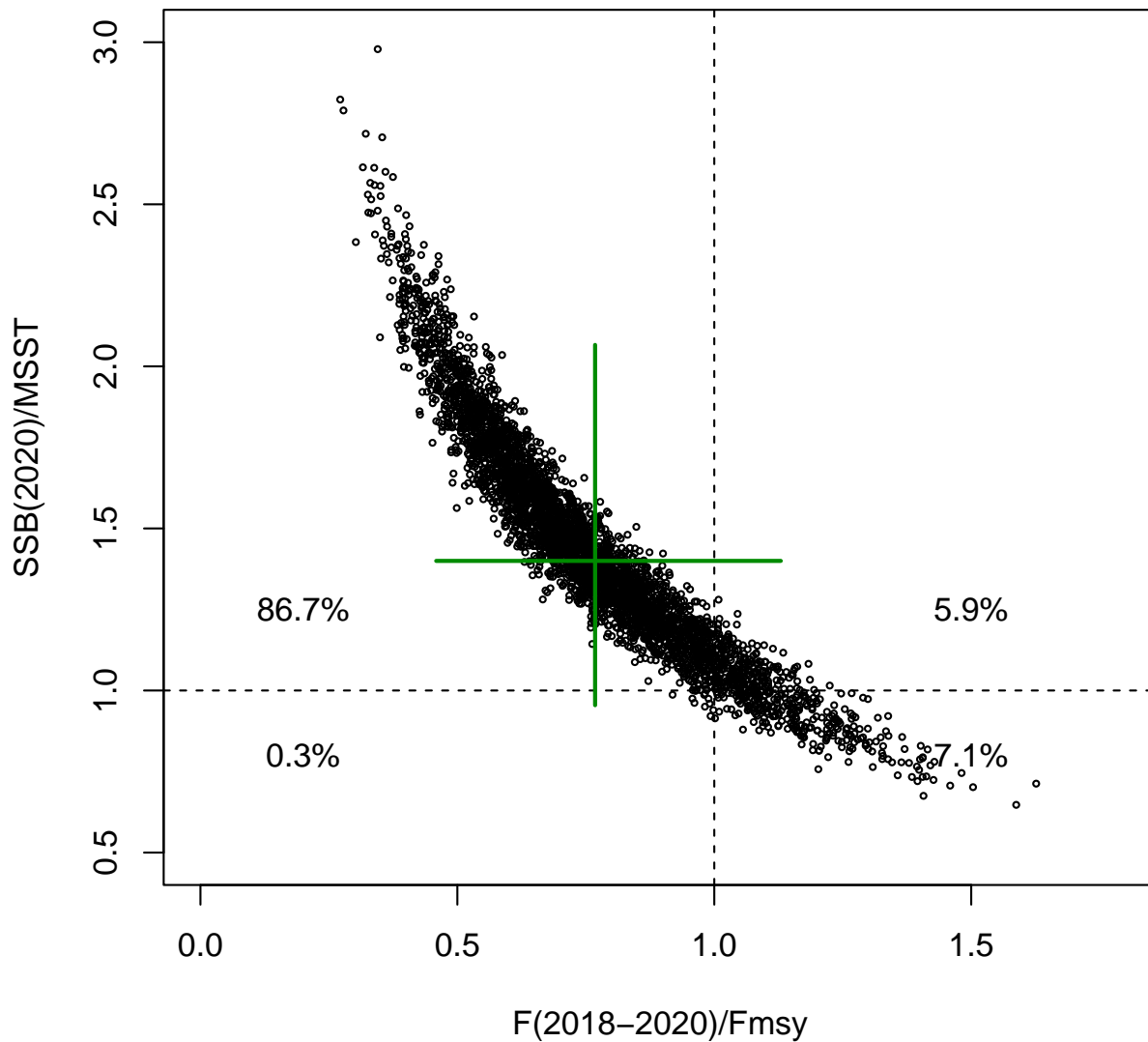


Figure 39. Phase plot of terminal status estimates from MCB analysis of the Beaufort Assessment Model. The intersection of crosshairs indicates estimates from the base run; lengths of crosshairs defined by 5th and 95th percentiles.

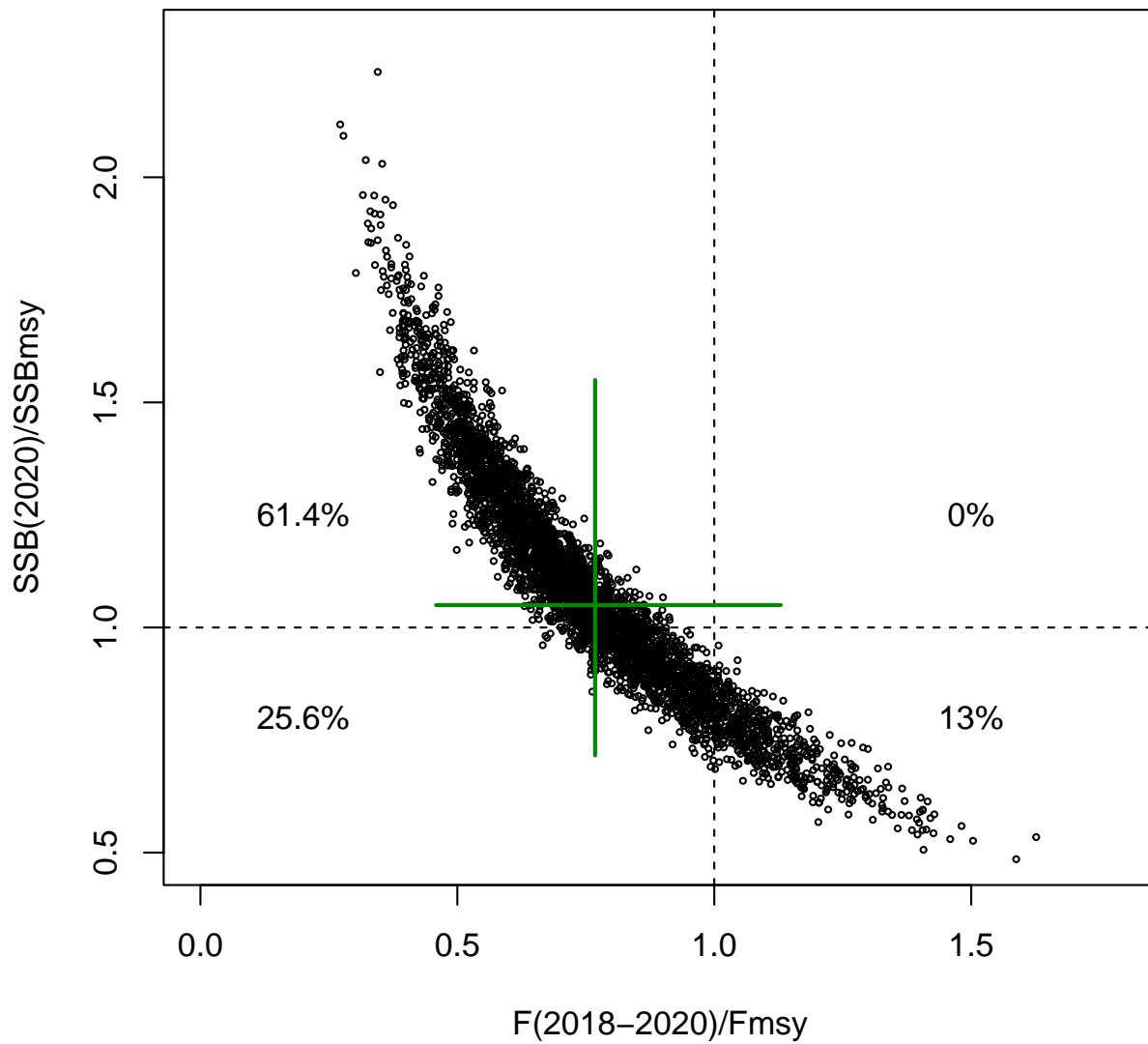


Figure 40. Probability densities of terminal status estimates from MCB analysis of the Beaufort Assessment Model. Solid vertical lines represent point estimates from the base run and dashed vertical lines indicated the median of MCB trials.

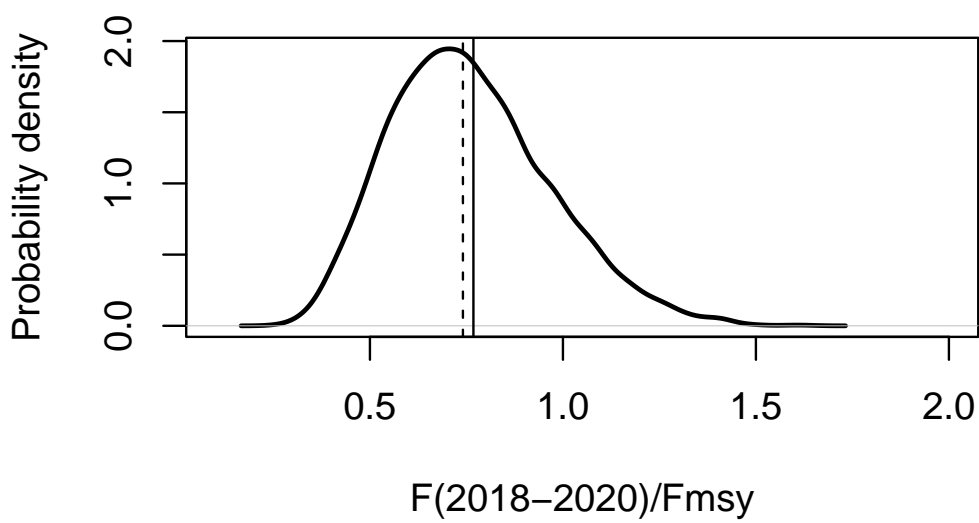
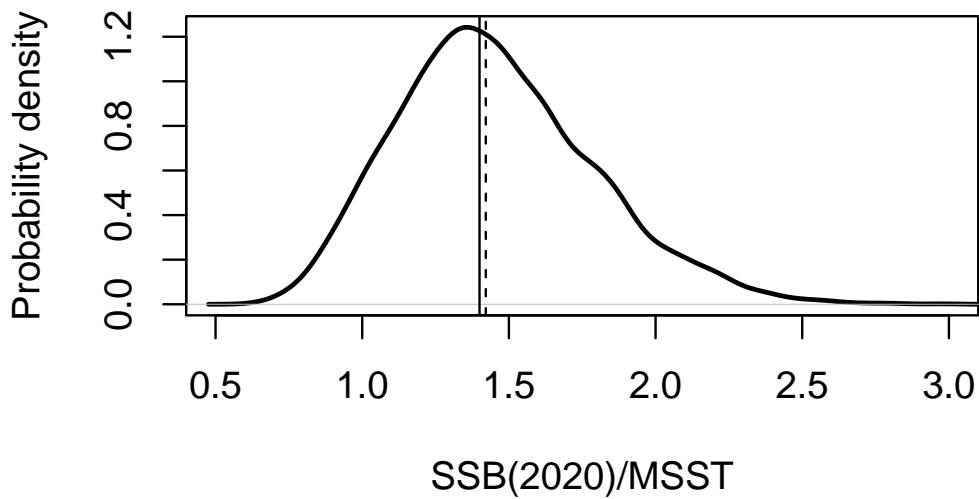


Figure 41. Comparison between SEDAR-28 and SEDAR-78 status indicators. Top panel: Apical F relative to F_{MSY} . Bottom panel: spawning biomass relative to MSST.

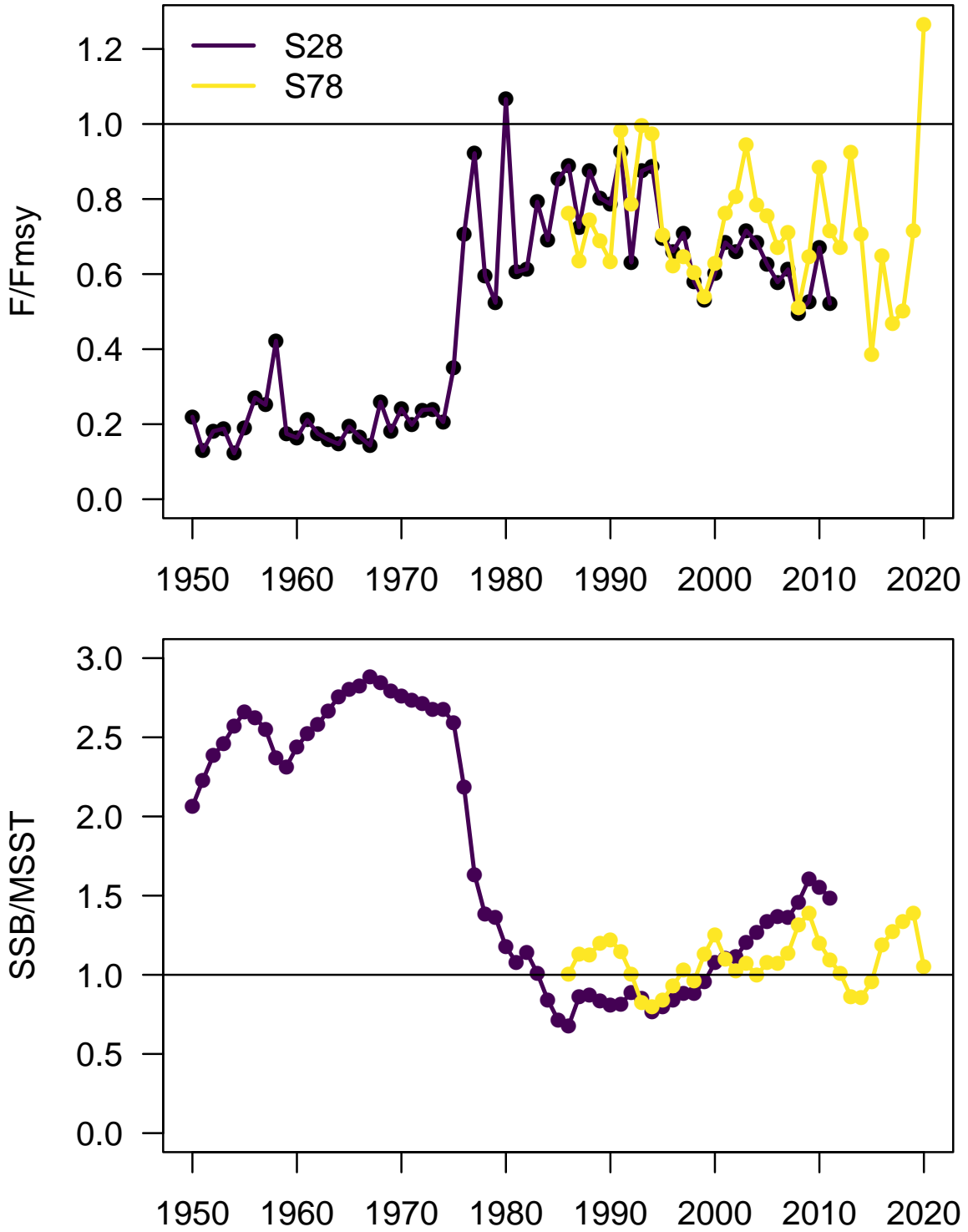


Figure 42. Spanish mackerel: Sensitivity of results to dropping the commercial handline (cH) index. (sensitivity run S1). Top panel – Ratio of F to F_{MSY} . Bottom panel – Ratio of SSB to SSB_{MSY} .

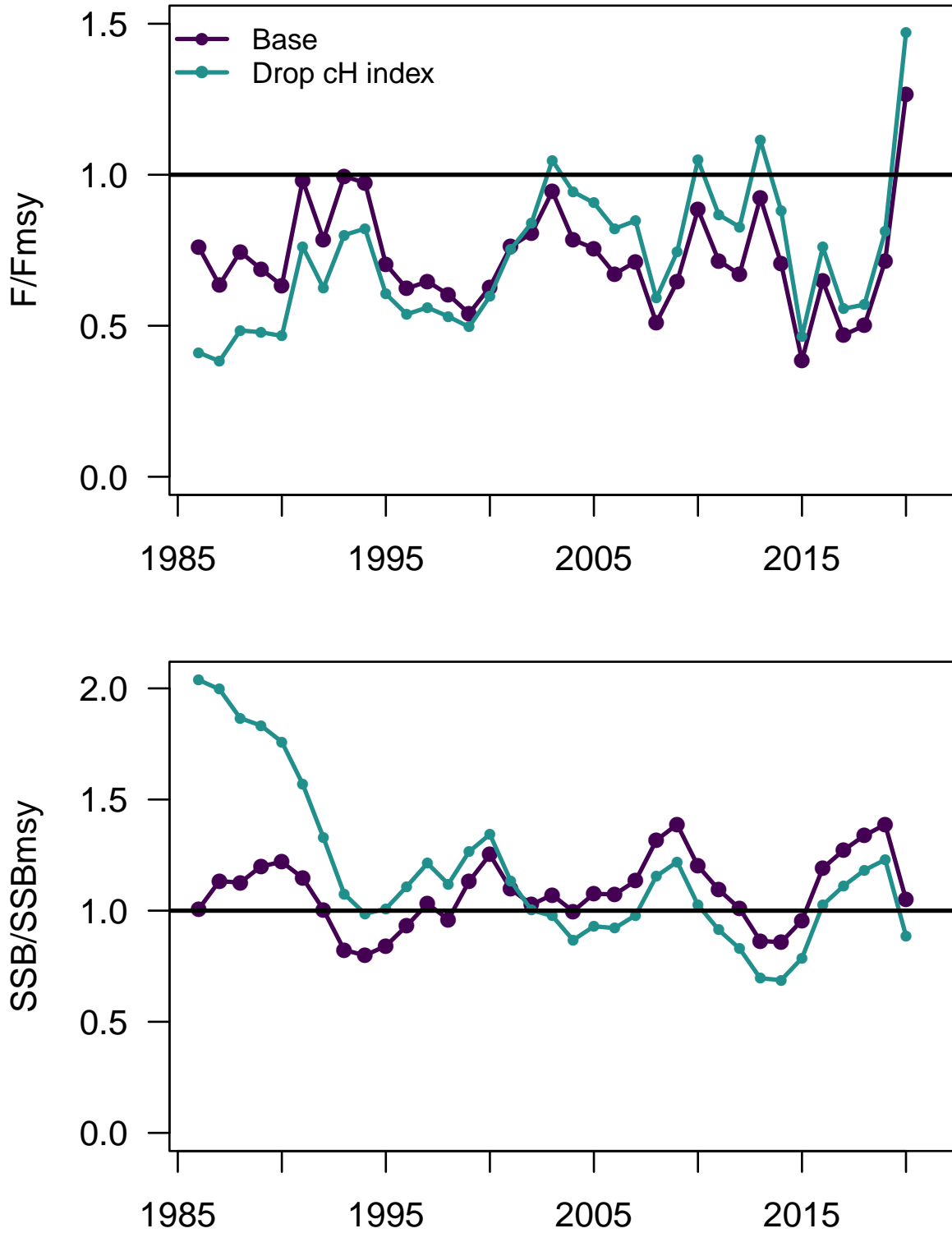


Figure 43. Spanish mackerel: Sensitivity of results to estimates of natural mortality M . (sensitivity runs S2 and S3). Top panel – Ratio of F to F_{MSY} . Bottom panel – Ratio of SSB to SSB_{MSY} .

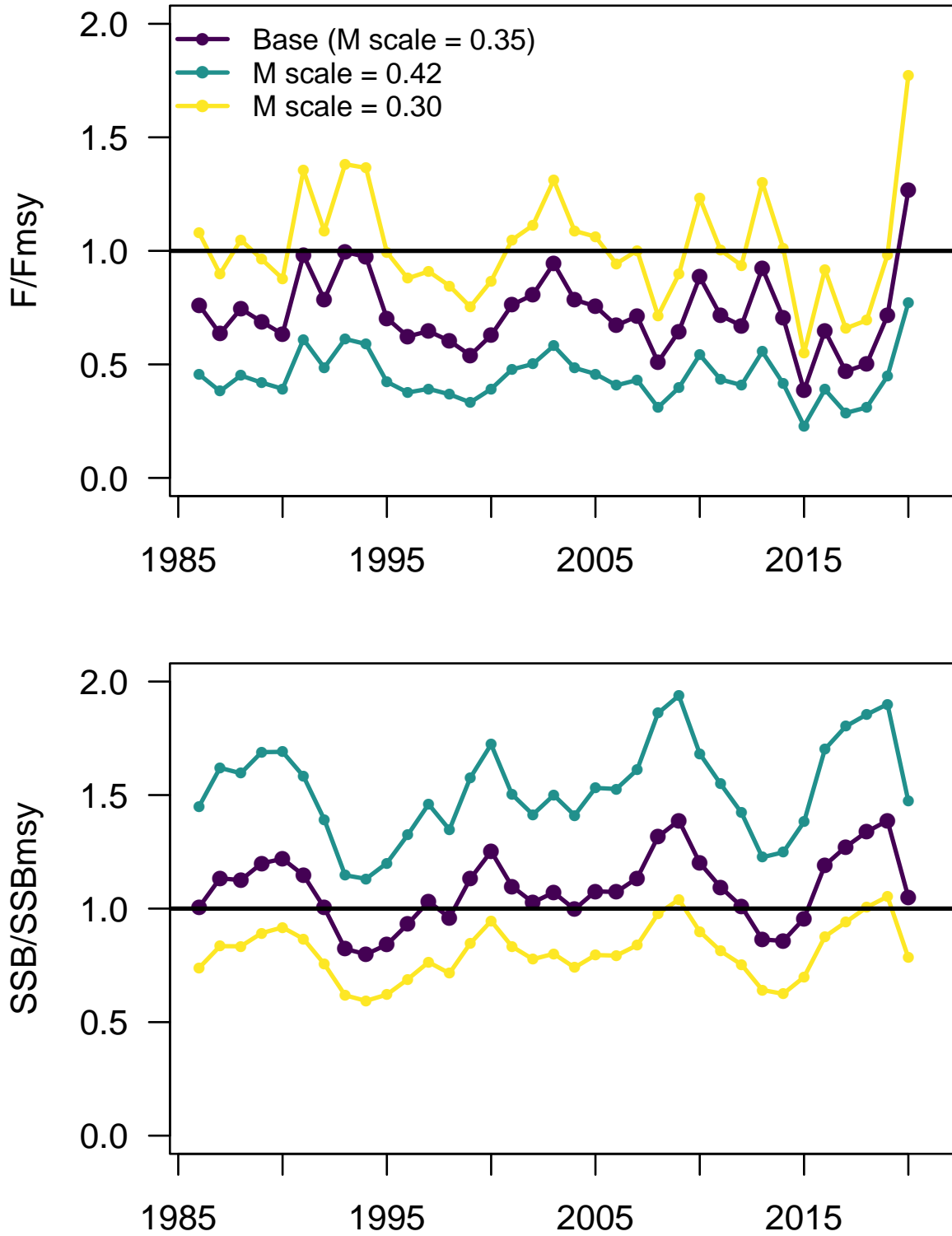


Figure 44. Spanish mackerel: Sensitivity of results to fixed values of steepness (sensitivity runs S4 and S5). Top panel – Ratio of F to F_{MSY} . Bottom panel – Ratio of SSB to SSB_{MSY} .

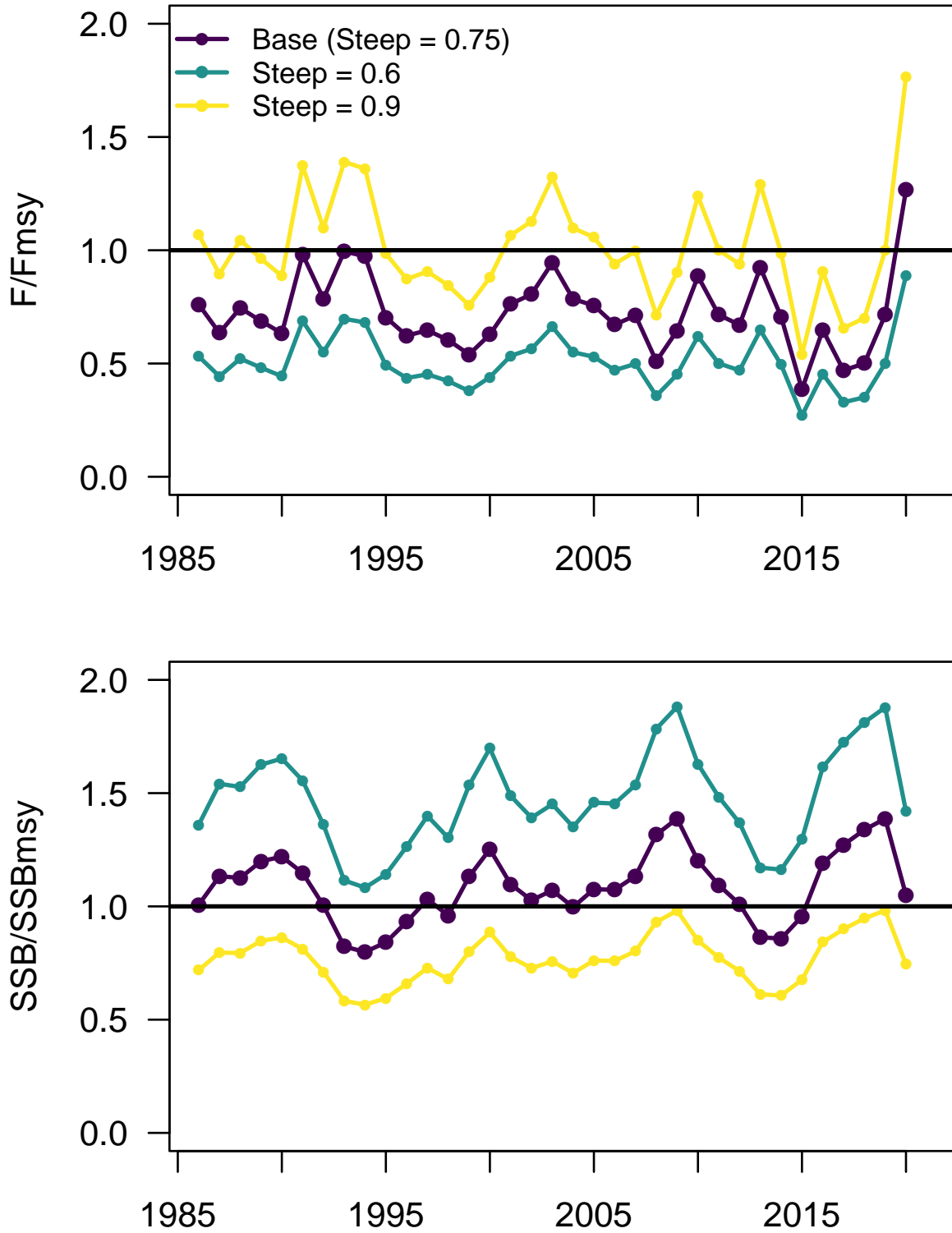


Figure 45. Spanish mackerel: Sensitivity of results to fixed values of general recreational (GR) discard mortality rate. (sensitivity runs S6 and S7). Top panel – Ratio of F to F_{MSY} . Bottom panel – Ratio of SSB to SSB_{MSY} .

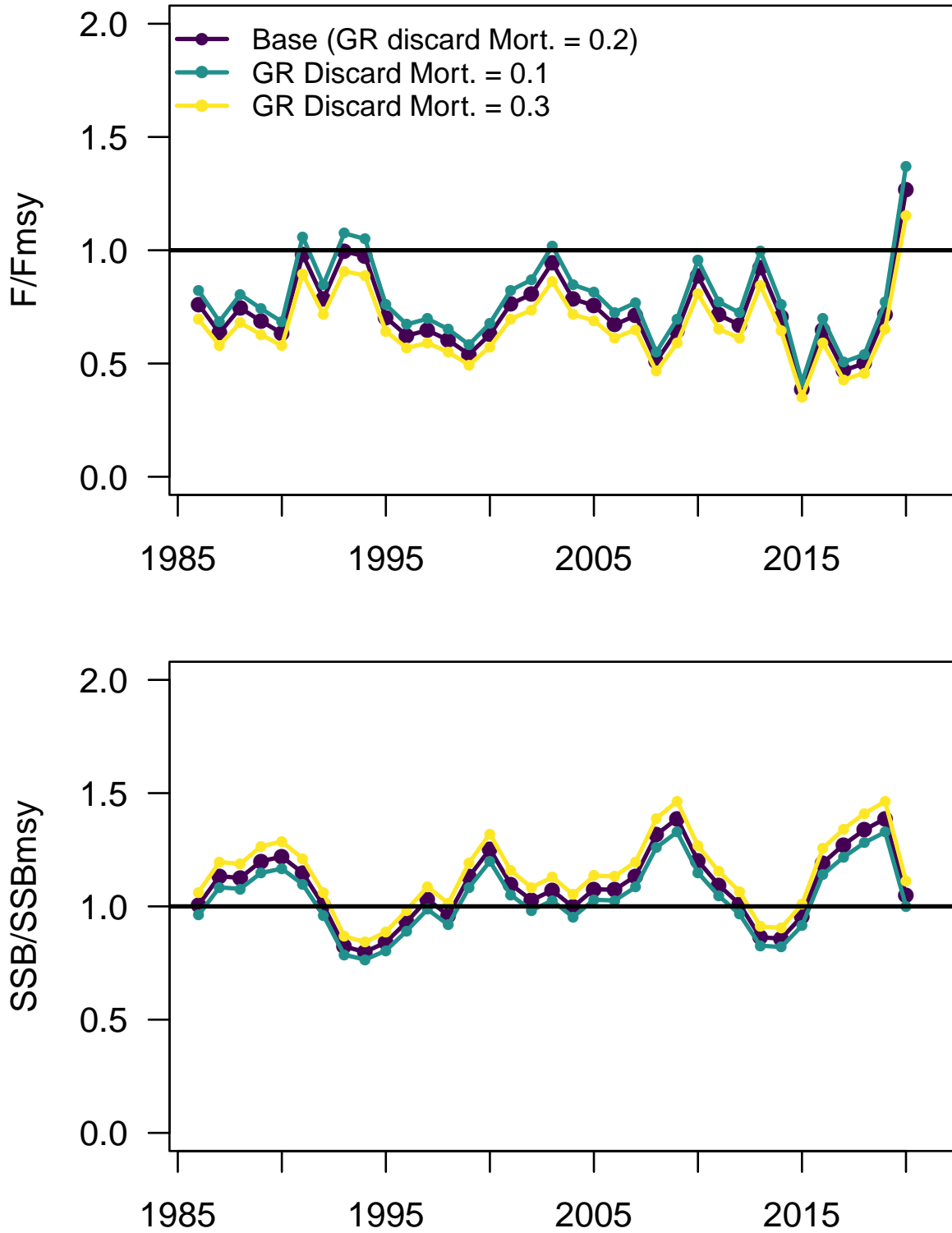


Figure 46. Retrospective analyses. Sensitivity to terminal year of data (sensitivity runs Retro 1–5). Top Panel: Fishing mortality rate, where solid circles show geometric mean of terminal three years, as used to compute fishing status. Middle Panel: Recruitment time series. Bottom Panel: Spawning stock biomass time series.

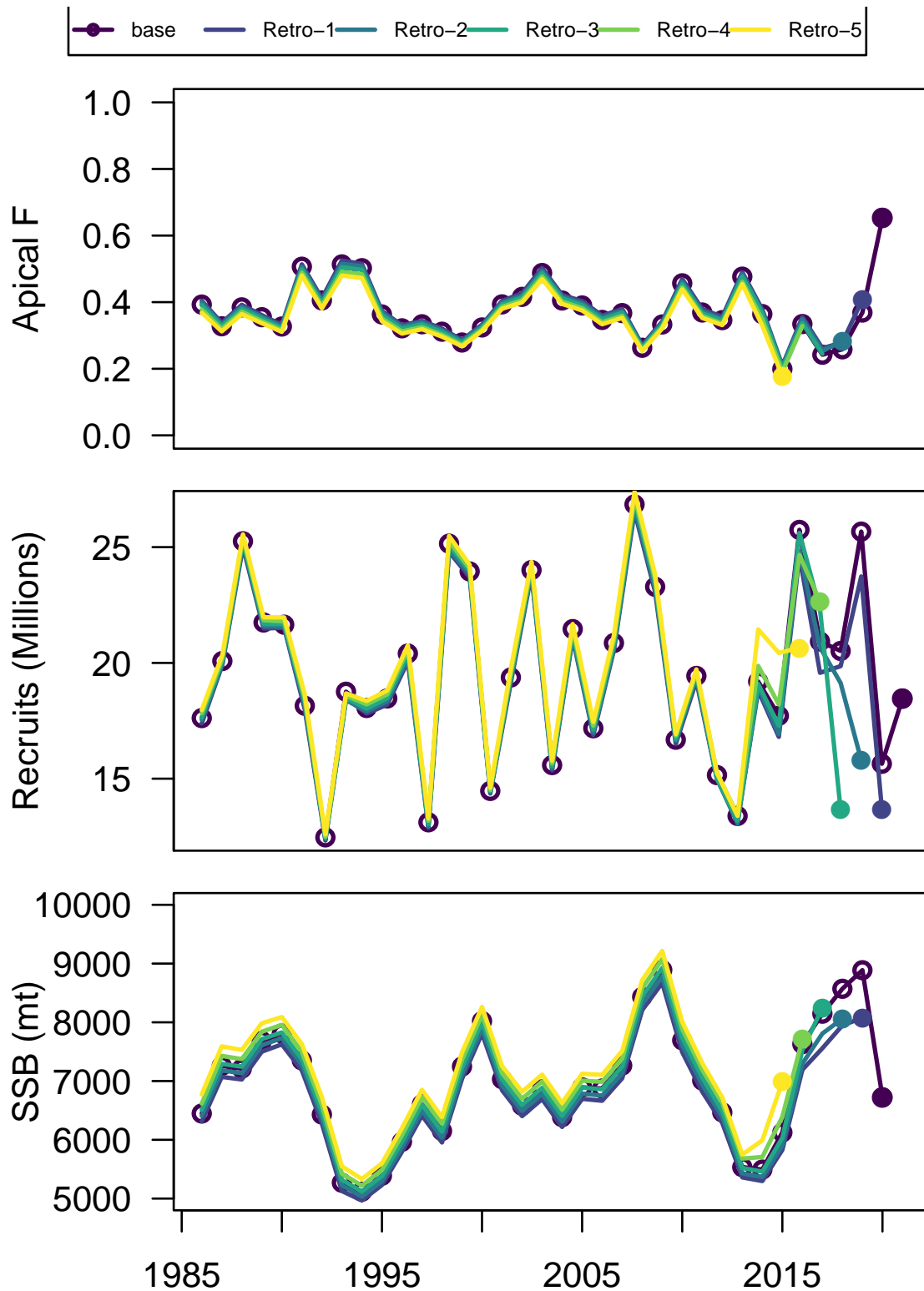


Figure 47. Retrospective analyses. Sensitivity to terminal year of data (sensitivity runs Retro 1–5). Top panel: Relative fishing mortality rate time series. Bottom panel: Relative spawning stock biomass time series.

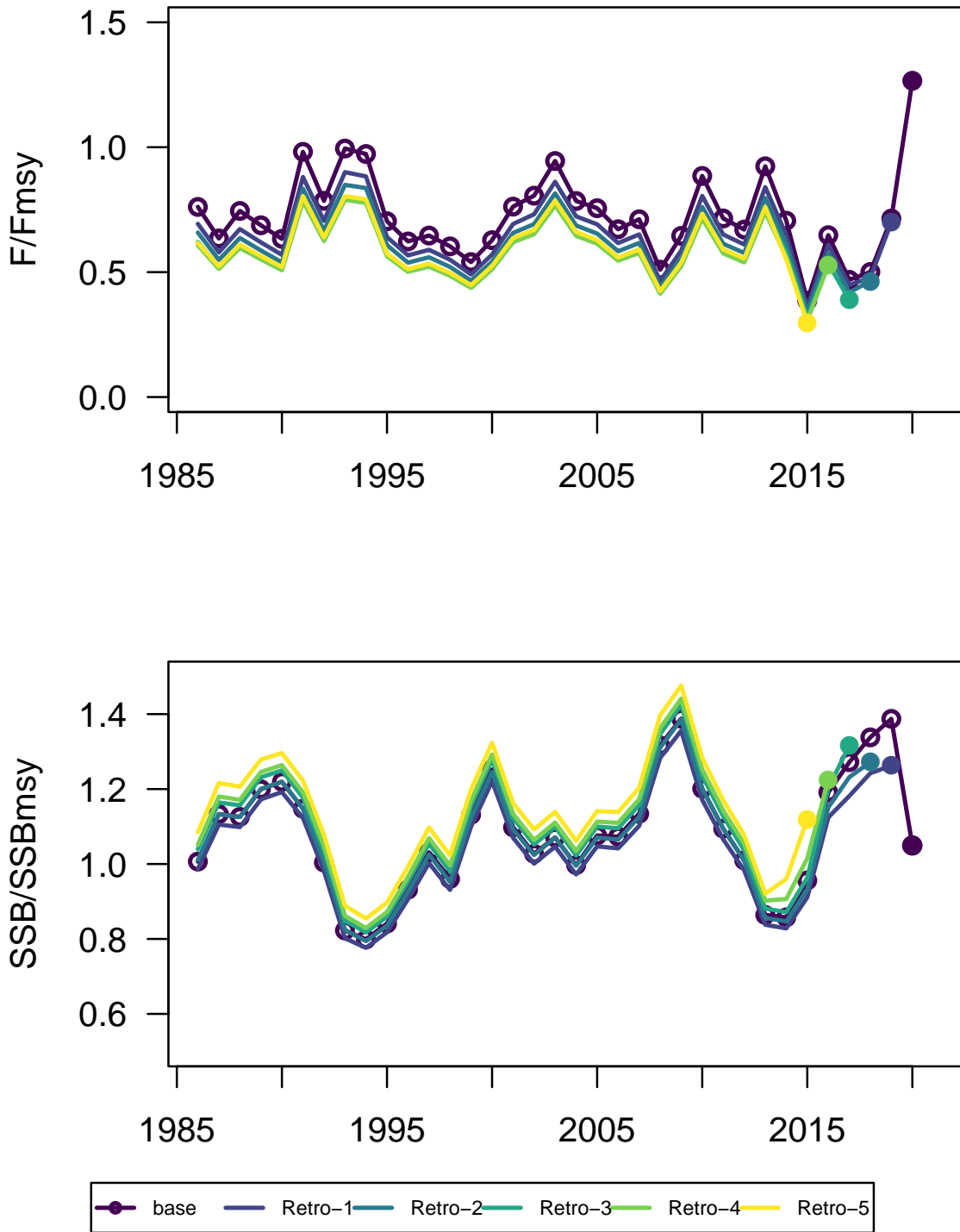


Figure 48. Projection results under scenario 1— $F = F_{\text{current}}$. Interim years (2021-2022) assume current landings based on average of the last 3 years of the assessment. Expected values (base run) represented by solid lines with solid circles, medians represented dashed lines with open circles, and uncertainty represented by thin lines corresponding to 5th and 95th percentiles of replicate projections. Horizontal lines mark MSY-related quantities. Spawning stock (SSB) is at time of peak spawning.

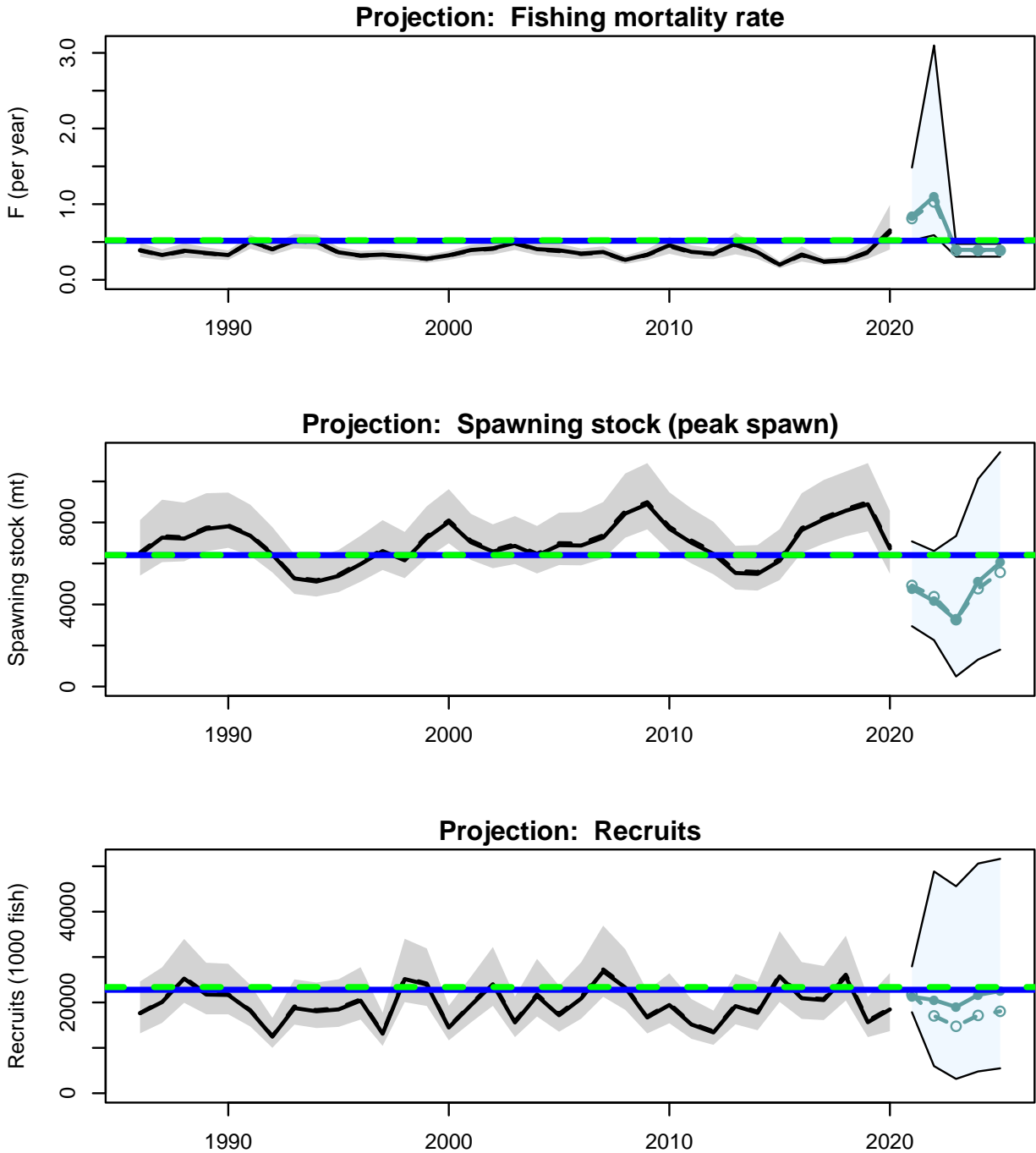


Figure 49. Projection results under scenario 2—fishing mortality rate fixed at $F = F_{MSY}$. Interim years (2021-2022) assume current landings based on average of the last 3 years of the assessment. Expected values (base run) represented by solid lines with solid circles, medians represented dashed lines with open circles, and uncertainty represented by thin lines corresponding to 5th and 95th percentiles of replicate projections. Horizontal lines mark MSY-related quantities. Spawning stock (SSB) is at time of peak spawning.

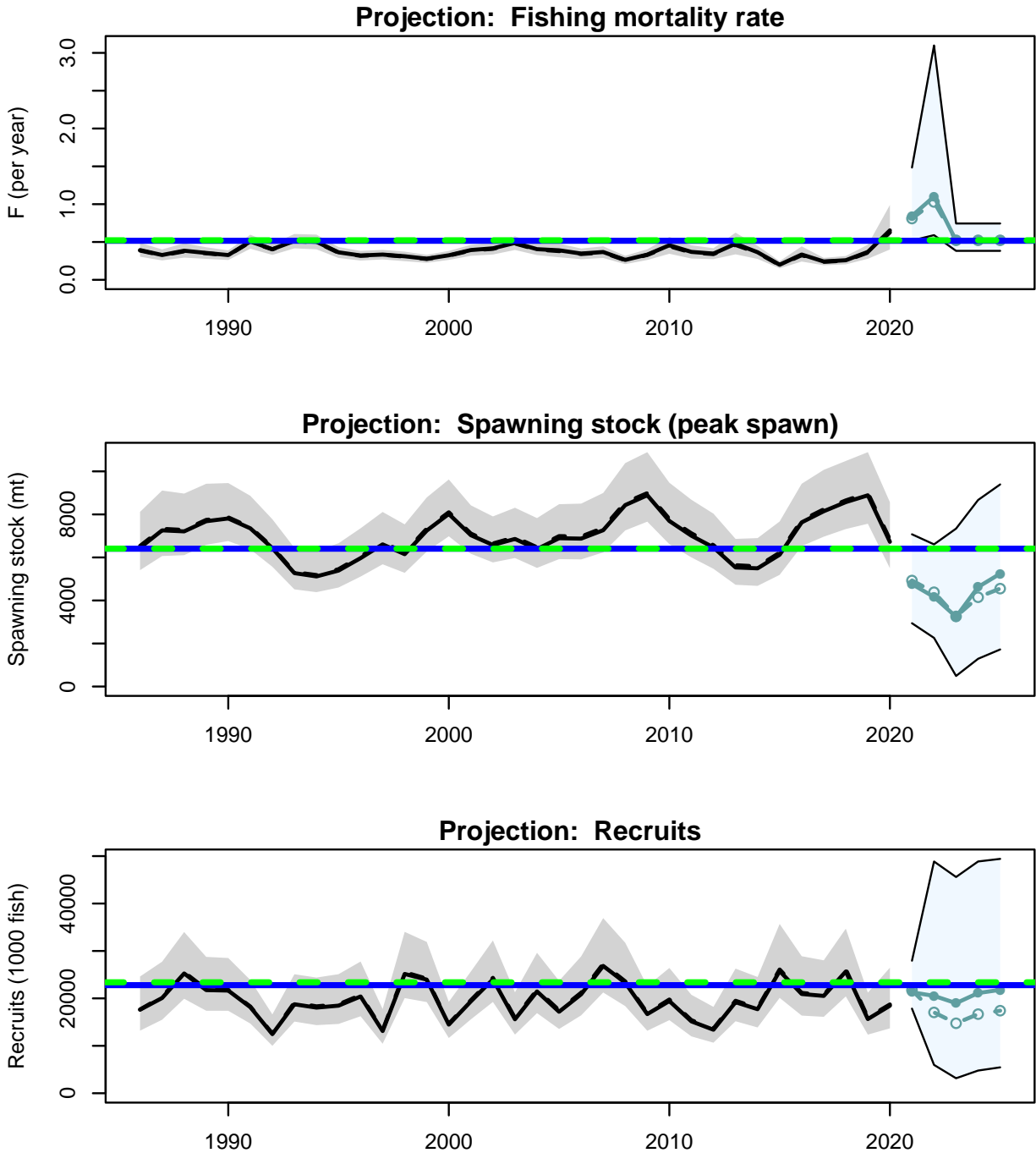
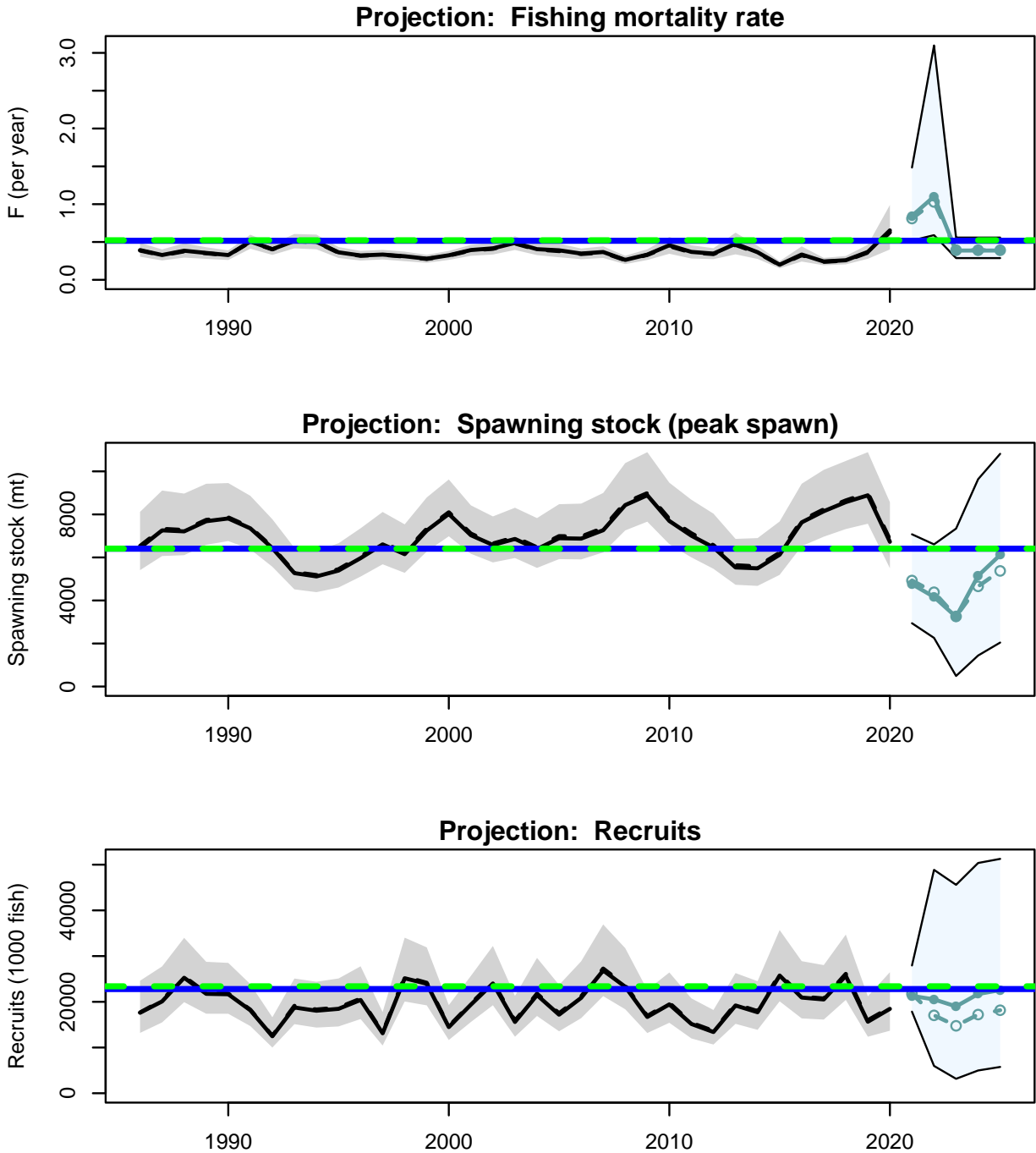


Figure 50. Projection results under scenario 3—fishing mortality rate fixed at $F = 75\%F_{MSY}$. Interim years (2021-2022) assume current landings based on average of the last 3 years of the assessment. Expected values (base run) represented by solid lines with solid circles, medians represented dashed lines with open circles, and uncertainty represented by thin lines corresponding to 5th and 95th percentiles of replicate projections. Horizontal lines mark MSY-related quantities. Spawning stock (SSB) is at time of peak spawning.



Appendix A Abbreviations and symbols*Table 27. Acronyms and abbreviations used in this report*

Symbol	Meaning
ABC	Acceptable Biological Catch
AW	Assessment Workshop (here, for Spanish mackerel)
ASY	Average Sustainable Yield
B	Total biomass of stock, conventionally on January 1 ^r
BAM	Beaufort Assessment Model (a statistical catch-age formulation)
cC	Commercial cast net fleet
cG	Commercial gillnet fleet
cH	Commercial handline fleet
cP	Commercial pound net fleet
CPUE	Catch per unit effort; used after adjustment as an index of abundance
CV	Coefficient of variation
DW	Data Workshop (here, for Spanish mackerel)
F	Instantaneous rate of fishing mortality
F_{MSY}	Fishing mortality rate at which MSY can be attained
FL	Fork length
GLM	Generalized linear model
GR	General recreational fleet (all MRIP modes and headboat)
K	Average size of stock when not exploited by man; carrying capacity
kg	Kilogram(s); 1 kg is about 2.2 lb.
klb	Thousand pounds; thousands of pounds
lb	Pound(s); 1 lb is about 0.454 kg
m	Meter(s); 1 m is about 3.28 feet.
M	Instantaneous rate of natural (non-fishing) mortality
MCBE	Monte Carlo/Bootstrap Ensemble, an approach to quantifying uncertainty in model results
MFMT	Maximum fishing-mortality threshold; a limit reference point used in U.S. fishery management; often based on F_{MSY}
mm	Millimeter(s); 1 inch = 25.4 mm
MRFSS	Marine Recreational Fisheries Statistics Survey, a data-collection program of NMFS, predecessor of MRIP
MRIP	Marine Recreational Information Program, a data-collection program of NMFS, descended from MRFSS
MSST	Minimum stock-size threshold; a limit reference point used in U.S. fishery management. The SAFMC has defined MSST for Spanish mackerel as $75\%SSB_{MSY}$.
MSY	Maximum sustainable yield (per year)
mt	Metric ton(s). One mt is 1000 kg, or about 2205 lb.
N	Number of fish in a stock, conventionally on January 1
NC	State of North Carolina
NMFS	National Marine Fisheries Service, same as “NOAA Fisheries Service”
NOAA	National Oceanic and Atmospheric Administration; parent agency of NMFS
OY	Optimum yield; SFA specifies that $OY \leq MSY$.
PSE	Proportional standard error
R	Recruitment
SAFMC	South Atlantic Fishery Management Council (also, Council)
SC	State of South Carolina
SCDNR	Department of Natural Resources of SC
SDNR	Standard deviation of normalized residuals
SEDAR	SouthEast Data Assessment and Review process
SFA	Sustainable Fisheries Act; the Magnuson–Stevens Act, as amended
SL	Standard length (of a fish)
SPR	Spawning potential ratio
SSB	Spawning stock biomass; mature biomass of males and females
SSB_{MSY}	Level of SSB at which MSY can be attained
TIP	Trip Interview Program, a fishery-dependent biodata collection program of NMFS
TL	Total length (of a fish), as opposed to FL (fork length) or SL (standard length)
VPA	Virtual population analysis, an age-structured assessment
WW	Whole weight, as opposed to GW (gutted weight)
YOY	Young of the year index developed from SEAMAP Coastal Trawl Survey
yr	Year(s)

Appendix B Parameter estimates from the Beaufort Assessment Model

```

# Number of parameters = 310 Objective function value = 2973.77904752711 Maximum gradient component = 0.000879228531802875
# Linf:
582.500000000
# K:
0.598000000000
# t0:
-0.500000000000
# len_cv_val:
0.120000000000
# Linf_L:
680.400000000
# K_L:
0.197000000000
# t0_L:
-2.77000000000
# len_cv_val_L:
0.120000000000
# Linf_f:
610.100000000
# K_f:
0.620000000000
# t0_f:
-0.500000000000
# len_cv_val_f:
0.120000000000
# log_Nage_dev:
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0.00562194911400
# log_R0:
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# steep:
0.750000000000
# rec_sigma:
0.600000000000
# R_autocorr:
0.000000000000
# log_rec_dev:
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# log_dm_ch_ac:
0.616417221901
# log_dm_cg_ac:
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# log_dm_cp_ac:
2.72105272183
# log_dm_cc_ac:
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# log_dm_GR_ac:
3.14243380487
# selpar_A50_ch1:
2.31133913893
# selpar_slope_ch1:
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# selpar_A50_cg1:
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# selpar_A502_cg1:
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# selpar_slope2_cg1:
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# selpar_szero_cp1:
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# selpar_Afull_cp1:
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# selpar_sigma_cp1:
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# selpar_slope_cc1:
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# selpar_szero_GR1:
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# selpar_Afull_GR1:
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# selpar_sigma_GR1:
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# log_q_ch:
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# log_q_GR:
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# log_q_YOY:
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# q_BW_log_dev_ch:
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0.0000000000 0.0000000000 0.0000000000 0.0000000000 0.0000000000 0.0000000000 0.0000000000 0.0000000000 0.0000000000 0.0000000000 0.0000000000 0.0000000000

```

```

0.0000000000
# q_RW_log_dev_GR:
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0.0000000000 0.0000000000 0.0000000000 0.0000000000 0.0000000000 0.0000000000 0.0000000000 0.0000000000 0.0000000000 0.0000000000 0.0000000000 0.0000000000
0.0000000000 0.0000000000 0.0000000000 0.0000000000 0.0000000000 0.0000000000 0.0000000000 0.0000000000 0.0000000000 0.0000000000 0.0000000000 0.0000000000
0.0000000000
# M_constant:
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# log_avg_F_cH:
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# log_F_dev_cH:
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-0.773849512885 -0.975754357605 -0.895806835335 -0.719737649762 -0.278521273967 -0.199274607475 -0.105975420020 -0.110909913118 0.544656493736 0.855079192784
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1.31336156275 1.16792219245 1.17261835781 1.00524958721 1.17130645576
# log_avg_F_cG:
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# log_F_dev_cG:
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# log_avg_F_cP:
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# log_F_dev_cP:
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# log_avg_F_cC:
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# log_F_dev_cC:
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# log_F_dev_GR:
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# log_avg_F_GR_D:
-4.24134871870
# log_F_dev_GR_D:
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-0.398119102519 -0.0719811459720 0.249684850194 -1.04499631792 0.0294114383125 0.662666416546 -0.138161952401 0.256056050997 0.917902110163 -0.174298611039
0.350561739618 -0.648577990851 0.0299420045855 0.441850783971 0.471326601580 0.697762872342 0.437493705108 0.373292599054 0.922392565273 0.572066115831
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# log_avg_F_SB_D:
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# log_F_dev_SB_D:
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0.266275849831 0.806973563402 0.134248494258 0.250424332840 0.643307972386 0.200352755145 0.0748201997507 0.200265020569 -0.0905045472839 0.169350014858
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# F_init_mult:
0.595961359447

```

SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

SCIENTIFIC AND STATISTICAL COMMITTEE



Joint South Atlantic and Gulf of Mexico SSC

August 04, 2022

MEETING REPORT

FINAL

VERSION
FINAL
8/25/22

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* Indicates documents not available for the Briefing Book. These will be distributed as they become available and added to Recent Documents section of the webpage.

SAFMC PUBLIC COMMENT PROCESS

Written comment:

Written comment on SSC agenda topics is provided to the Committee through an online form, similar to all other Council briefing materials. Written comment can be submitted at [this link](#). For this meeting, the deadline for submission of written comment is 9:00 a.m. August 4, 2022.

Verbal comment:

Two opportunities for comment on agenda items will be provided at set times during SSC meetings. The first will be at the beginning of the meeting, and the second near the conclusion. Those wishing to comment should indicate such in the manner requested by the Chair, who will then recognize individuals to provide comment.

An opportunity for comment on specific agenda items will also be provided as each item comes up for discussion. Comments will be taken after all the initial presentations are given and before the SSC starts the discussion of the agenda topic. As before, those wishing to comment should indicate such in the manner requested by the Chair, who will then recognize individuals to provide comment. All comments are part of the record of the meeting.

Meeting Format:

This meeting will be held as a webinar on August 4, 2022. Registration for the meeting can be found at the Council's website: <https://safmc.net/scientific-and-statistical-committee-meeting/>

1. JOINT SSC INTRODUCTIONS

1.1 Documents

Attachment 1: SSC August 2022 Agenda

1.2 Action

- Introductions
- Review and Approve Agenda
 - *Meeting agenda approved*
- Meeting Procedures
 - *South Atlantic is lead Council for this Joint meeting*
 - *Jeff Buckel will Chair, Fred Scharf is Vice-chair*
 - *SA operates by Consensus: no motions or voting*
 - *Use SA ABC Control Rule*

2. PUBLIC COMMENT

The public is provided this comment period for any general comments pertaining to any items on the agenda. There will also be time provided for public comment during each specific agenda item as they are discussed. Those wishing to make comment should indicate their desire to do so to the Committee Chair.

3. SOUTHEASTERN U.S. YELLOWTAIL SNAPPER INTERIM ANALYSIS

3.1 Documents

Attachment 3a: Stock Assessment Report for Yellowtail Snapper

*Attachment 3b: Presentation for Yellowtail Snapper

Attachment 3c: Terms of Reference for Yellowtail Snapper

Attachment 3d: October 2020 Joint SSC Report

Attachment 3e: South Atlantic ABC Control Rule for Yellowtail Snapper

3.2 Presentation

Shanae Allen and Chris Swanson, FWC-FWRI

3.3 Overview

An interim analysis was conducted for Yellowtail Snapper following the Benchmark SEDAR 64 (S64) stock assessment. This analysis applied updated landings and discards data for each fleet (commercial, headboat, and MRIP [a combination of charter, private, and shore modes]) to the S64 base model from 2018 – 2020. Adjusted projections of spawning stock biomass, recruitment, and retained yield to inform the Acceptable Biological Catch (ABC) and the Annual Catch Limit (ACL) account for the updated landings and discards. The interim analysis found that Yellowtail

Snapper was not overfished nor undergoing overfishing in the terminal year 2020. The MFMT (defined as $F_{30\%SPR}$) was estimated to be 0.429 yr^{-1} and F_{current} was estimated to be 0.292 yr^{-1} ; therefore, the F ratio ($F_{\text{current}}/\text{MFMT}$) was equal to 0.68. The $\text{SSB}_{F30\%SPR}$ for this interim analysis was estimated at 1,915.86 metric tons (4,223,743 pounds) and the MSST (defined as $0.75 * \text{SSB}_{F30\%SPR}$) was therefore defined as 1,436.90 metric tons (3,167,807 pounds). $\text{SSB}_{\text{current}}$ was estimated to be 2,810.33 metric tons (6,195,718 pounds); therefore, the SSB ratio ($\text{SSB}_{\text{current}}/\text{MSST}$) was equal to 1.47.

Previous meetings of the Joint SSCs in July and October 2020 deemed the SEDAR 64: Southeastern Yellowtail Snapper is consistent with the best scientific information available and useful for management advice. The SSCs recommended using the calculated P^* value of 0.375 to produce ABCs using the South Atlantic Council's ABC Control Rule, and also recommended that the Council consider adjusting the ACL or ACT for management uncertainty (e.g., $0.75 * F_{30\%SPR}$; see Attachments 3d and 3e). Due to the length of time elapsed between the terminal year and management action, this interim analysis was conducted using updated data streams to inform projections. The SSCs are asked to review the interim analysis of Southeastern U.S. Yellowtail Snapper, discuss, and provide feedback on projections and uncertainties, and make catch level recommendations.

3.4 Public Comment

3.5 Action

➤ **Review Interim Analysis**

- Does the interim analysis address the TORs to the SSCs satisfaction?
 - *Yes, all TORs were addressed to the SSC's satisfaction.*
- Are there any issues with the interim analysis that would prevent it from providing fishing level recommendations?
 - *No issues*
- Is the Yellowtail Snapper interim analysis consistent with the best scientific information available?
 - *The Interim Analysis is consistent with BSIA as specified by the TORs for this assessment.*
 - *However, the interim analysis process has not yet been vetted by the SA-SSC. The SA-SSC is awaiting further information and evaluation to determine under what circumstances interim analyses can be considered BSIA. The GOM-SSC has apparently accepted some types of interim analyses in the past. There was some confusion in the terminology and configuration of this interim analysis when compared to an assessment. The interim analysis provided by the FWC for yellowtail snapper was different from past interim analyses provided to the GOM-SSC from the SEFSC.*
 - *Research recommendation: Compare the different types of interim analyses provided by the SEFSC and the FWC.*

Provide ToRs for the guidance of this comparison. Determine robustness of the analyses for providing catch advice.

- *Yuying Zhang offered advice on this research based on their results from a customized MSE approach that is in development*
- *Other research recommendations to be explored to address identified uncertainties for the yellowtail snapper assessment (in next FWC assessment):*
 - *Update indices (as these were not updated in this interim analysis).*
 - *Update MRIP catch per trip estimates*
 - *Re-emphasize previous research recommendations from S64 Benchmark assessment review*

➤ **Provide fishing level recommendations**

- Complete the catch level recommendations table and make recommendations for OFL and ABC.
- Comment on any difficulties encountered in applying the Control Rule, including any required information that is not available.
 - *Increased level of uncertainty surrounding the use of P^* from the benchmark assessment for the interim analysis projections given the time elapsed since setting the initial P^* from the benchmark assessment and the fact that the characterization of uncertainty in the projections did not account for natural mortality and discard mortality.*
 - *The SSCs had considerable discussion about reducing P^* given the above considerations.*
 - *The SSCs recommend setting OFL at the yield achieved at $F_{30\%SPR}$ and ABC at the yield achieved at $P^* = 0.375$*
 - *P^* to remain unchanged from 0.375, but recommend Council select ACL or ACT to account for additional uncertainty that is described above (90% or 75% of $F_{30\%SPR}$)*

Table 1. Joint SSC catch level recommendations for Southeastern Yellowtail Snapper. Projected landings in millions of pounds under $F_{30\%SPR}$ (MFMT/OFL), the fishing mortality rate that corresponds to a P^* value of 0.375 (ABC), 90% of $F_{30\%SPR}$, and 75% of $F_{30\%SPR}$ from 2021 – 2031.

Year	$F_{30\%SPR}$ (OFL)	$P^* = 0.375$ (ABC)	90% of $F_{30\%SPR}$	75% of $F_{30\%SPR}$
2023	3.922	3.887	3.733	3.432
2024	3.774	3.749	3.635	3.401
2025	3.684	3.665	3.576	3.385
2026	3.625	3.610	3.537	3.375
2027	3.584	3.572	3.510	3.367

4. OTHER JOINT COMMITTEE BUSINESS

- Update on the Joint South Atlantic and Gulf of Mexico SSC Workgroup for Unassessed Stocks
 - *SA SSC members appointed to workgroup: Kai Lorenzen (chair), Wally Bublely, Amy Schueller, Genny Nesslage, and Anne Lange*
 - *GOM SSC members appointed to workgroup: Trevor Moncrief, Jason Adriance, Luiz Barbieri, Roy Crabtree, and David Griffith*
 - *Will convene a short webinar meeting this fall to discuss TORs, schedule, etc.*
 - *Original workgroup scope of work and objectives to be reviewed and considered by Joint workgroup members before meeting*
 - *Work may focus initially on addressing Goliath grouper stock ABC as requested by SA and GOM Councils.*

5. JOINT CONSENSUS STATEMENT AND RECOMMENDATIONS

The Committee is provided an opportunity to review its report, final consensus statements, and final recommendations.

JOINT MEETING ADJOURNED AT 12:05 P.M. EDT

--- LUNCH BREAK ---

(Following agenda items addressed by South Atlantic SSC only)

6. INTRODUCTION

6.1 Documents

Attachment 6: Minutes from April 2022 SSC Meeting

6.2 Action

- Introductions
 - *Agenda approved*
 - *Welcomed returning member, Marcel Reichert*
- Approve Minutes
 - *Minutes approved*

7. SEDAR 78: SOUTH ATLANTIC SPANISH MACKEREL OPERATIONAL ASSESSMENT

7.1 Documents

Attachment 7a: Stock Assessment Report for Spanish Mackerel

Attachment 7b: Presentation for Spanish Mackerel

Attachment 7c: Terms of Reference for Spanish Mackerel

Attachment 7d: S78 WP03, General Recreational Catch

Attachment 7e: South Atlantic ABC Control Rule

7.2 Presentation

Dr. Erik Williams, Southeast Fishery Science Center (Beaufort)

7.3 Overview

Spanish Mackerel was last assessed during the 2012 SEDAR 28 Benchmark, which indicated the stock was not overfished and not undergoing overfishing. For this SEDAR 78 assessment, data compilation and assessment methods were guided by methodology of SEDAR 28, as well as by current SEDAR practices and recommendations by the SEDAR 28 review panel. The assessment period is 1986–2020. The base-run estimate of terminal (2020) spawning stock was above the MSST ($SSB_{2020}/MSST = 1.40$), as was the median estimate from the MCBE ($SSB_{2020}/MSST = 1.42$), indicating this stock is not overfished. The estimated fishing rate has been at or below the maximum fishing mortality threshold (MFMT), represented by F_{MSY} with the exception of the terminal year (2020). The terminal estimate, which is based on a three-year geometric mean, was below F_{MSY} in the base run ($F_{2018-2020}/F_{MSY} = 0.77$) and in the median of the MCBE ($F_{2018-2020}/F_{MSY} = 0.74$). Thus, this assessment indicated that the stock is not experiencing overfishing. However, this result requires caution: if the overfishing rate of 2020 continued in 2021, the geometric mean would indicate overfishing. The SSC is asked to review the SEDAR 78: South Atlantic Spanish Mackerel Operational Assessment, comment and discuss projections and uncertainties, apply the South Atlantic Council's ABC Control Rule, and make catch level recommendations.

SSC General Comments:

- *Age comps and state/federal harvest breakdown is not accounted for in the assessment for all sectors (e.g. lack of age comps for commercial cast net). Substantial regional differences in how fishery is prosecuted, and lack of adequate sample sizes across sector type create large data gaps in the assessment and the need to pool age comps across years.*
- *10 years since last assessment → Given the time since the last assessment, further flexibility should have been provided for the operational assessment to make updates. Given this, a research track should be considered for next assessment.*

- *Several data (e.g. MRIP data) and model inputs (e.g. natural mortality, steepness, selectivity) that need to be explored more thoroughly (see below) and not under OA framework.*

7.4 Public Comment

- *See meeting transcript for public comment*
 1. *Ben Hartig*
 2. *Thomas Newman*
 3. *Dewey Hemilright*

7.5 Breakout Groups

- *Breakout group discussions recorded separately*
- *Breakout Group 1*
 - *SSC members: Chris Dumas (Rapporteur), Fred Scharf, Fred Serchuk, Jared Flowers, Jeff Buckel, Kai Lorenzen*
 - *Other: Julie Neer*
- *Breakout Group 2*
 - *SSC members: Dustin Addis (Rapporteur), Jie Cao, Marcel Reichert, Amy Schueller, Jennifer Sweeney-Tookes, Anne Lange*
 - *Other: Chip Collier*
- *Breakout Group 3*
 - *SSC members: Genny Nesslage (Rapporteur), Eric Johnson, George Sedberry, Scott Crosson, Wally Bublely, Yan Li*
 - *Other: Mike Schmidtke, Carolyn Belcher, Christina Wiegand, Emilie Franke, Jacob Espittia, Jeff Renchen*

7.6 Action

➤ **Review Assessment:**

- Does the assessment address the ToRs to the SSCs satisfaction?
 - Growth models shifted by one year between SEDAR 28 and SEDAR 78. Explain the cause of the shift and discuss the implications (status, productivity).
The SSC doesn't know why the growth model was shifted by one year, nor the effect on the status and productivity of stock.
 - Steepness was fixed at 0.75 (same as in SEDAR 28). Is this appropriate for Spanish mackerel? Describe the impact of fixed steepness in general, and this fixed value in particular on Spanish Mackerel productivity estimates, reference points, and recruitment estimation in projections.
The stock-recruitment (SR) data did not allow for an updated estimate of steepness in SEDAR 78; there was a cluster of points in the NE quadrant of the SR graph providing no information for a steepness estimate (no points were located in the SW area of the

graph). Steepness estimates from similar species do not appear to be available. The steepness value used in the SEDAR 78 (same as SEDAR 28) has high uncertainty as indicated by likelihood profiles.

- Assess uncertainties within the recreational data sources:
 - Are PSEs for the recreational catch estimates acceptable? *Not addressed*
 - Does the model fully incorporate the reported recreational catch estimation uncertainty? *Not addressed*
 - What is the impact of recreational catch uncertainty on stock status and productivity estimates? *Not addressed*
 - Recreational catch data from 2020 appears highly influential to model results. Does the 2020 data suggest a shift in fishing pressure or patterns, or is it an artifact of estimation uncertainty? Discuss the implications, to status and projected yield, of the sudden increase in recreational catch in the terminal year.
Given that a 3-year average of fishing mortality was used, the 2020 estimate of catch is not currently influential; however, given that the 2021 estimate is similar or larger, the 3-year average may begin to affect stock status in the next few years. In contrast, the 2020 estimate does, already, affect projections. During the pandemic, total fishing effort was increased, which indicates that the increases seen for Spanish mackerel are not unexpected.
 - Describe the impact of the revised MRIP estimates on stock productivity measures.
The revised MRIP estimates increase uncertainty. The model's estimates of stock size are going down in recent years while the observed landings are increasing. The increased landings could be driving the population down but there is uncertainty if this is the case given information provided during public input that suggests the potential for an increased stock size that could promote greater landings with no change in effort (e.g. questions about the accuracy of recent MRIP data, commercial quotas being met earlier in year during recent years). Shore-mode landings (these were higher than private boat mode which doesn't match on the water observations) appear to be important and driving changes in increased recreational landings.

- Are there any issues with the assessment configuration or uncertainties in the input data that limit the use of this assessment for providing stock status and supporting fishing level recommendations?
 - Discuss the predictive ability of the stock-recruit relationship for estimating MSY and F_{msy} and supporting stock projections.
 - *Parameters describing the SR curve were not updated from the 2012 assessment. The analysts were constrained in exploring this in more detail because SEDAR 78 was an OA.*
 - *The SR data do not show a clear pattern (a cluster of points in the NE quadrant of graph) and estimates of steepness from these data were unreliable. Steepness estimates from similar species are not available.*
- Does the assessment represent Best Scientific Information Available?
 - *The constraints of the OA and the poor quality/lack of data were a concern. Data/assessment concerns include:*
 - *The declining trend in biomass estimated by the OA was not reflective of what stakeholders described or observed in fishery-independent data sampling further north (NEAMAP).*
 - *Not clear that the current sampling program represents the current geographic distribution of the fishery (increased occurrences to the north suggests that the stock boundaries may have shifted).*
 - *There were questions regarding the recreational landings in recent years, especially shore-based mode (What is driving the increase in shore landings in recent years? Is it real?).*
 - *There have been large changes in the fishery (e.g. commercial cast-net landings have increased in importance), but large portions of the OA are based on the 2012 SEDAR 28 Benchmark that is now over a decade old.*
 - *The steepness estimate for the stock-recruitment curve was based on the 2012 assessment; this constrained the analysts.*
 - *The OA imposed constraints on the analysts. The SSC recommends a research track assessment be considered for the next assessment.*
 - *SEDAR 78 was sensitive to the same parameters (e.g., natural mortality--affected by changes made to growth model, negative t_0 , but little data to inform estimates of v -Bert curve; steepness) as those found for SEDAR 28.*

Changes in these parameters can change stock status as indicated by sensitivity analyses.

- *Jumps in recreational landings may reflect increases in recreational effort, increases in stock size or a combination of both.*
- *Over the last several years, commercial fisheries have been meeting quotas earlier in the year: is this because of increased effort or increased stock size?*
- *Because the evidence for a change in stock status is not strong, there is a concern that projections are not sufficiently robust. Projections (unlike current stock status) are influenced greatly by terminal year (2020), and terminal year is highly uncertain.*
- *The assessment model is estimating a decrease in spawning stock size as a result of the increases in catch and this is driving need for future catch reductions in the projections; however, other sources of evidence suggests that the stock size could be increasing.*

➤ **Identify, summarize, and discuss assessment uncertainties**

- Review, summarize, and discuss the factors of this assessment that affect the reliability of estimates of stock status and fishing level recommendations.
 - Characterize these factors in terms of their influence on assessment uncertainty and fishing level recommendations.
 - *As is common in many assessments, steepness and natural mortality are uncertain:*
 - *Steepness not estimable, and was fixed from previous assessment – SEDAR 28. There was no signal from data to inform steepness. This would apply to the ABC control Tier I.*
 - *Natural mortality was fixed from previous assessment – SEDAR 28. Natural mortality was found to have a significant impact on stock status. Likelihood profiles showed that natural mortality could be much higher (>0.5), which, if true, would indicate stock size is higher than currently estimated.*
 - *Lack of adequate representation of length and age samples from each fishery (most fleets) to inform fishing mortality.*
 - *Uncertainty of the Shrimp bycatch estimates was high (pdf pg 73). The observer coverage is extremely sparse and effort data are questionable.*

- *Lack of a pelagic fishery independent index of adult abundance*
 - *Commercial Handline index fits were poor (severe underfitting/overfitting)*
 - *Model ignored initial year of MRIP CPUE index (which was a relatively extreme value)*
 - Address potential impacts of COVID events on input data series. For example:
 - How might the missing 2020 SEAMAP survey value affect abundance or mortality estimates?
 - *The influence of the lack of SEAMAP 2020 will be difficult to determine until additional years of data are collected.*
 - How did the interruptions in MRIP sampling impact 2020 estimates and their uncertainty?
 - *Somewhat addressed due to imputations used by MRIP to account for reduced sampling in 2020. The influence of the lack of SEAMAP 2020 data and the value of 2020 MRIP data will be difficult to determine until additional years of data are collected. We must evaluate the congruencies or incongruencies of these data to previous or future years' data.*
 - List the risks and describe potential consequences of assessment uncertainties with regard to status, fishing level recommendations, and future yield predictions.
 - *When stock biomass is decreasing and fishing mortality is increasing in the terminal year, increased uncertainty can lead to overfished or overfishing stock status.*
 - Are methods of addressing uncertainty consistent with SSC expectations and the available information?
 - *The methods of addressing uncertainty are consistent with SSC expectations and the available information. Dimension II – (2) Environmental variables are not considered.*
- **Review the assessment projections and provide fishing level recommendations**
- Apply the ABC control rule and complete the fishing level recommendations table.
Pending SSC decision to accept the assessment for mgmt.:
 - **ABC-CR Dimension Tiers for SEDAR78:**
 - *I. Assessment Information → Tier 2 (2.5%)*
 - *II. Uncertainty Characterization → Tier 2 (2.5%)*
 - *III. Stock Status → Tier 1 (0%)*

- *IV. Productivity and Susceptibility (PSA) – Risk Analysis → Tier 2 (5%)*
 - *Total ABC adjustment = 10.0%*
 - *P-star value = 40.0%*
- Review the projection methods and the assumptions applied for the interim period (between the terminal year and the first year of management)
 - Do the projections and interim assumptions adequately capture uncertainty in the model and data? Uncertainty in recruitment?
 - *No, the SSC has several concerns with the assessment, including:*
 - *Commercial age sampling possibly inadequate*
 - *MRIP – high PSEs, uncertainty in terminal year data point*
 - *Influence of bad fit to initial year REC index (high value GR) on SSB*
 - *Uncertainty in steepness*
 - *Model likelihood profiling points to potentially higher natural mortality*
 - *YOY index missing terminal year data*
 - *Effect of removing early years with higher landings*
- Concerns have been expressed about the declining stock abundance and yield in the projection years, particularly since catch has been held below the current ABC and ACL and overfishing has not occurred.
 - Are the projected F rates in 2021-2022 reflective of the fishery?
 - *Given the concern with this OA, more attention should be paid to 2021-2022 MRIP estimates used in projections given the large sudden change in magnitude. Major source of uncertainty in setting catch levels. Would indicate a large increase in shore-based effort, which may or may not be realistic. With COVID, perhaps more shore-based angler effort, but in 2022 inflation may have decreased angler effort – TBD. More investigation is needed.*
 - How do the projected catch levels compare to catch levels observed in recent years in the model?
 - *Higher than 2020*
 - Comment on the implications of the expected spawning stock biomass in the projections falling outside the range of observed values.

- *If model is overestimating F in last few years, SSB decline is overestimated. However, if the Fs are truly that high, this response is to be expected.*
 - Comment on any difficulties encountered in applying the Control Rule, including any required information that is not available.
 - *No difficulties were encountered.*
- **Provide guidance for information to include in the Coastal Migratory Pelagic (CMP) SAFE report.**
 - OFL/ACL monitoring: Discuss any potential issues in monitoring the commercial and recreational Spanish mackerel fishery.
 - *Potential movement of the stock northward in terms of ACL monitoring*
 - Catch level reports: What threshold of change in landings/discards should be used for the SSC to receive additional analyses to describe the estimate?
 - *Not addressed*
 - Population trends: Discuss which index of abundance is most suitable for monitoring the stock for inclusion in future SAFE report.
 - *Not addressed*
- **Provide research recommendations and guidance on the next assessment:**
 - Review the included research recommendations and indicate those most likely to reduce risk and uncertainty in the next assessment.
 - *The research recommendations that will most likely reduce risk and uncertainty in the next assessment include those that address the issues with SEDAR 78 described above (e.g. steepness, natural mortality, age comps).*
 - Provide any additional research recommendations the SSC believes will improve future stock assessments.
 - *Based on public comments from commercial fishermen, the stock may be moving northward, so research on stock distribution is warranted*
 - *Recreational discards – better characterization of age/size composition and mortality of discarded fish*
 - Provide guidance on the next assessment, addressing its timing, need for topical working groups, and assessment type.
 - *Reminder: More than 2-3 topical working groups indicates that the assessment should be considered for a research track.*
 - *Not addressed specifically in terms of working groups, but the SSC recommends a research track consideration.*

- Provide comments for the development of the scope of work for the next assessment (if operational assessment recommended)
 - *See comments above. An operational assessment is not recommended for the next assessment.*

CONSENSUS STATEMENT:

- *The SSC has several concerns with this OA before deeming consistent with BSIA:*
 - *The assessment model is appropriate, but inputs need to be more thoroughly investigated.*
 - *There are several concerns with certain aspects of the data quality that should be more thoroughly investigated before setting catch level recommendations*
 - *The operational assessment TORs constrained the modeling approach and there could be alternative data inputs that would benefit future assessments (something for future deliberation by the SSC)*
 - *Stock status classification has great deal of uncertainty because of terminal year data; this uncertainty leads into little confidence in projections.*
 - *Specific investigations into certain data inputs or model components (see lists above) should occur before management advice can be provided:*
 - *Technical group/subset of SSC members to compile specific list of recommendations to the SEFSC to improve upon assessment in order to achieve stock status determination and catch level recommendations.*
 - *Dustin Addis*
 - *Marcel Reichert*
 - *Yan Li (joined after the meeting)*

Table 2. SSC catch level recommendations for South Atlantic Spanish Mackerel (**Values to be added after refitting of the model**).

Criteria		Deterministic		Probabilistic	
Overfished evaluation (SSB/MSST)					
Overfishing evaluation (F/F _{MSY})					
MFMT (F _{MSY})					
SSB _{MSY} (metric tons)					
MSST (metric tons)					
MSY (1000 lbs.)					
Y at 75% F _{MSY} (1000 lbs.)					
ABC Control Rule Adjustment					
P-Star					
SSC recommended P _{Rebuild}					
M					
OFL RECOMMENDATIONS					
Year	Landed (lbs ww)	Discard (lbs ww)	Landed (number)	Discard (number)	
2023					
2024					
2025					
ABC RECOMMENDATIONS					
Year	Landed (lbs ww)	Discard (lbs ww)	Landed (number)	Discard (number)	
2023					
2024					
2025					

8. OTHER BUSINESS

9. PUBLIC COMMENT

The public is provided one final opportunity to comment on SSC recommendations and agenda items.

See meeting transcript for public comment:

1. *Dewey Hemilright*
2. *Ben Hartig*

10. CONSENSUS STATEMENT AND RECOMMENDATIONS

The Committee is provided an opportunity to review its report, final consensus statements, and final recommendations.

The Final SSC report will be provided to the Council by 9:00 a.m. on Friday, August 26, 2022 (approximately 3 weeks from the end of the meeting) for inclusion in the briefing book for the September Council meeting.

11. NEXT MEETINGS

11.1 Scientific and Statistical Committee Meetings

- October 25-27, 2022 in Charleston, SC
- February (TBD webinar as needed)
- April 18-20, 2023 in Charleston, SC
- October 24-26, 2023 in Charleston, SC

11.2 South Atlantic Fishery Management Council Meetings

- September 12-16, 2022 in Charleston, SC
- December 5-9, 2022 in Wrightsville Beach, NC
- March 6-10, 2023 in Jekyll Island, GA
- June 12-16, 2023 in PonteVedra, FL

ADJOURNED AT 6:21 p.m.

FINAL
SUMMARY REPORT
MACKEREL COBIA COMMITTEE
SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL
Charleston, South Carolina
September 15, 2022

The Committee approved minutes from the March 2022 meeting and the agenda.

Update on amendments recently submitted to NMFS

At the December 2021 meeting, the Council approved CMP Amendment 32 (Gulf cobia catch levels and management measures) for formal review. The Gulf Council approved CMP Amendment 32 for final action at their October 2021 meeting. The document was transmitted to NMFS on February 18, 2022, and the proposed rule published on July 7, 2022. At the March 2022 meeting the Council approved CMP Amendment 34 (Atlantic king mackerel catch levels and management measures) for formal review. The document was transmitted to NMFS on August 5, 2022.

CMP Amendment 33 – Updates to Gulf king mackerel management based on SEDAR 38 Update 2020

Matt Freeman, Gulf Council staff, presented draft options to be considered in Amendment 33, which proposes modifications to catch limits and sector allocations for Gulf king mackerel based on the results of the SEDAR 38 Update stock assessment. The stock assessment found that Gulf king mackerel was not overfished or undergoing overfishing. However, recruitment has been low over the last 10 years, and the spawning stock biomass (SSB) is below the SSB at maximum sustainable yield. The Committee reviewed the CMP FMP goals and objectives, the proposed action and alternatives, and actions taken by the Gulf Council during their June 2022 meeting.

The following motions were approved:

MOTION 1: ADD THE FOLLOWING LANGUAGE TO THE JOINT CMP FMP OBJECTIVES: TO ACHIEVE ROBUST FISHERY REPORTING AND DATA COLLECTION SYSTEMS ACROSS ALL SECTORS FOR MONITORING THE COASTAL MIGRATORY PELAGIC FISHERY WHICH MINIMIZES SCIENTIFIC, MANAGEMENT, AND RISK UNCERTAINTY.

APPROVED BY COMMITTEE

APPROVED BY COUNCIL

MOTION 2: REMOVE CURRENT OBJECTIVE 3 FROM THE CMP FMP OBJECTIVES.

Objective 3: To provide necessary information for effective management and establish a mandatory reporting system for monitoring catch.

APPROVED BY COMMITTEE

APPROVED BY COUNCIL

MOTION 3: AMEND THE LANGUAGE OF OBJECTIVE 1 TO READ AS FOLLOWS:

Objective 1 reads as follows: The primary objective of this FMP is to **ACHIEVE AND MAINTAIN OPTIMUM** yield ~~at the maximum sustainable yield (MSY)~~, **TO** allow recovery of overfished populations, and maintain population levels sufficient to ensure adequate recruitment.

APPROVED BY COMMITTEE

APPROVED BY COUNCIL

Atlantic Spanish Mackerel Management Overview

Staff presented an overview of management concerns that have arisen in the Spanish mackerel fishery since 2018 to provide context for the Council when discussing the SEDAR 78: Atlantic Spanish mackerel stock assessment.

SEDAR 78: Atlantic Spanish Mackerel Assessment

SEDAR 78 was completed in July 2022 and included an assessment for Atlantic Spanish mackerel. In August 2022, the Scientific and Statistical Committee (SSC) reviewed the results of the updated SEDAR 78 and recommended additional work completed. Shannon Cass-Calay presented the Southeast Fisheries Science Center (SEFSC) report and SSC Chair, Jeff Buckel, presented the SSC recommendations to the Committee. Council staff presented an overview of the Atlantic Spanish mackerel fishery.

The SEFSC will rerun the SEDAR 78 assessment model with new landings to address uncertainty with MRIP estimate in the terminal year. The SSC will review the changes at their upcoming October 2022 meeting and determine whether the changes were sufficient to address their cited concerns or if additional changes are needed. If additional changes are substantial, a research track assessment would be needed for Atlantic Spanish mackerel.

Given continuing closures in the commercial sectors, does the Council wish to apply the allocation decision tool to Spanish mackerel at the December 2022 meeting?

DIRECTION TO STAFF: PROCEED WITH APPLICATION OF ALLOCATION DECISION TOOL TO THE SPANISH MACKEREL FISHERY FOR BOTH SECTOR AND REGIONAL ALLOCATION TO BE DISCUSSED IN DECEMBER 2022

Topics for the Mackerel Cobia Advisory Panel

The Mackerel Cobia Advisory Panel is scheduled to convene on October 5th and 6th, 2022 in Charleston, South Carolina. Below is a list of approved topics for the AP's agenda:

- Update on amendments recently submitted.
- SEDAR 78: Atlantic Spanish Mackerel Stock Assessment
 - Update on stock assessment revisions.
 - Discussion of increased recreational shore-based landings and overall increase in recreational effort during the COVID19 pandemic.
 - Discussion of commercial trips limits and how the lower trip limit (500-pounds) has affected market price for Spanish mackerel.
- Discussion of the current false albacore (little tunny) fishery.
 - Have there been substantial changes in fishing behavior and catch levels for false albacore over the last five years?

- How have social and economic influences (ex. price and demand, infrastructure, community dependance) affected the false albacore fishery?
- What factors should the Council consider when determining whether or not false albacore are in need of conservation and management?
- What else is important for the Council to know about false albacore?
- Review of CMP FMP Goals and Objectives
- Discussion of CMP Amendment 33 and how increased Gulf king mackerel commercial allocation may impact market price of Atlantic king mackerel.
- Commercial electronic logbook
- NOAA North Atlantic Right Whales Proposed Vessel Speed Regulations
- Hudson Canyon National Marine Sanctuary Proposal
- Update Fishery Performance Reports for Atlantic king mackerel and FLEC cobia.
- Other Updates: Citizen Science, SEDAR, Climate Change Scenario Planning

Other Business

On September 19, 2022, the Council received a letter from the American Saltwater Guides Association requesting the consider re-adding false albacore to the CMP FMP. The Committee provided the following direction to staff:

- DEVELOP A WHITE PAPER EXAMINING IF FALSE ALBACORE MEET THE MSA CRITERIA FOR CONSERVATION AND MANAGEMENT AND DISCUSS WITH THE AP.
 - WORK WITH NC DMF STAFF
 - LOOK AT STATE VS. FEDERAL LANDINGS

 Note: Council staff drafts the timing and task motion based on Committee action. If points require clarification, they will be added to the draft motion. The Committee should review this wording carefully to be sure it accurately reflects their intent prior to making the motion.

Timing and Task(s)

MOTION 4: ADOPT THE FOLLOWING TIMING AND TASKS:

1. Work with Gulf Council staff, as needed, to continue work on Coastal Migratory Pelagics Amendment 33.
2. Add a review of the revised SEDAR 78 stock assessment to the SSC’s October 2022 meeting agenda.
3. Convene a meeting of the Mackerel Cobia Advisory Panel to discuss the agenda items as listed above in October 2022.
4. Develop a white paper that examines false albacore relative to the ten criteria outlined in the Magnuson-Stevens act to determine if they may be in need of conservation and management.
5. Prepare the allocation decision tool for Atlantic Spanish mackerel to be reviewed at the December 2022 meeting.

APPROVED BY COUNCIL



Atlantic States Marine Fisheries Commission

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MEMORANDUM

TO: Coastal Pelagics Management Board

FROM: Emilie Franke, FMP Coordinator

DATE: October 20, 2022

SUBJECT: Differences Between the Interstate FMP and Federal FMP for Spanish Mackerel

In February 2020, the former South Atlantic Management Board, which is now split into the Coastal Pelagics Management Board and Sciaenids Management Board, discussed differences between the Interstate Fishery Management Plan (FMP) for Spanish mackerel and the federal Coastal Migratory Pelagics FMP for Spanish mackerel. The last update to the Interstate FMP was the Omnibus Amendment for Spanish Mackerel, Spot, and Spotted Sea Trout (2011) and its Addendum I for Spanish Mackerel (2013).

Differences between the Interstate and Federal FMPs exist in terms of commercial management zones, commercial trip limits and closures, allowable gears, recreational season, and recreational accountability measures. Board action to consider addressing these differences was postponed until completion of the 2022 stock assessment. The differences between the Interstate and Federal FMPs are outlined below.

Definition of Commercial Management Zones

The Interstate FMP defines the Northern Zone as New York through Georgia, and the Southern Zone as the east coast of Florida. The Federal FMP defines the Northern Zone as New York through North Carolina, and the Southern Zone as South Carolina through Florida (through the Miami-Dade/Monroe County line). For the Interstate FMP, Rhode Island joined the interstate management unit in 2021.

Commercial Trip Limits and Closures

For their respective Northern Zones, both the Interstate and Federal FMPs set a 3,500-pound commercial trip limit. For the interstate Southern Zone, the trip limit starts at 3,500 pounds and is reduced throughout the season depending on the date and how much of the quota is met. For the federal Southern Zone, the trip limit also starts at 3,500 pounds and is reduced depending on how much of the quota is met.

In federal waters, each management zone closes when that federal zone's total quota is met. Under the Interstate FMP, states are not required to close state waters when federal waters close. In recent years, Maryland, Virginia, and North Carolina have implemented a reduced 500-pound trip limit in state waters when the Northern Zone federal waters closed.

M22-104

The commercial trip limits and management zones are summarized in the following table.

Commercial Management Zones and Trip Limits	
<p>Interstate FMP</p> <p><u>Northern Zone</u> New York to Georgia (RI joined in 2021)</p> <ul style="list-style-type: none"> – 3,500-pound trip limit – Not required to close when federal waters close. <p><i>Note: In recent years, Maryland, Virginia, and North Carolina have implemented a 500-lb trip limit in state waters when the Northern Zone federal waters closed.</i></p> <p><u>Southern Zone</u> Florida (east coast)</p> <ul style="list-style-type: none"> – 3,500-pound trip limit: 3/1-11/30; – 3,500 limit Mon-Fri & 1,500 limit Sat-Sun: 12/1 until 75% adjusted quota taken; – 1,500 limit until 100% adjusted quota taken; – 500 limit after 100% adj. quota taken; – Not required to close when federal waters close. 	<p>Federal FMP</p> <p><u>Northern Zone</u> New York to North Carolina</p> <ul style="list-style-type: none"> – 3,500-pound trip limit – Closed when Northern Zone total quota is met. <p><u>Southern Zone</u> South Carolina to Florida (east coast)</p> <ul style="list-style-type: none"> – 3,500-pound trip limit until 75% of the Southern Zone adjusted quota is met; – 1,500 limit until 100% of the Southern Zone adjusted quota is met; – 500 limit after 100% of the Southern Zone adjusted quota is met; – Closed when the Southern Zone total quota met.

Allowable Gears

The Interstate FMP lists prohibited gears for each sector. For the commercial sector, purse seines, and drift gill nets south of Cape Lookout, NC are prohibited. For the recreational sector, drift gill nets south of Cape Lookout, NC are prohibited. The Federal FMP lists allowable gears: only automatic reel, bandit gear, handline, rod and reel, cast net, run-around gillnet, and stab net allowed.

Recreational Season

The Interstate FMP specifies a calendar year recreational season, while the Federal FMP’s recreational fishing year is March 1 through the end of February.

Recreational Accountability Measures

Under the Interstate FMP, if the total annual catch limit (ACL) is exceeded and the stock is overfished, the recreational quotas are decreased via reduced bag limits the following year. Under the Federal FMP, if the total ACL is exceeded, bag limits are reduced the following year to achieve the annual catch target (ACT) but not to exceed the ACL. If the stock is overfished and the ACL is exceeded, there is a payback reducing the ACT by the overage amount the following year.

ATLANTIC STATES MARINE FISHERIES COMMISSION
REVIEW OF THE INTERSTATE FISHERY MANAGEMENT PLAN

FOR ATLANTIC COBIA
(Rachycentron canadum)

2021 FISHING YEAR



Prepared by the Plan Review Team

Draft for Board Review
October 2022



Sustainable and Cooperative Management of Atlantic Coastal Fisheries

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Draft for Board Review

I. Status of the Fishery Management Plan

<u>Date of FMP Approval:</u>	Original FMP – November 2017
<u>Amendments & Addenda:</u>	Amendment 1 – August 2019 Addendum 1 – October 2020
<u>Management Areas:</u>	The distribution of the Atlantic stock of cobia from Georgia through Rhode Island
<u>Active Boards/Committees:</u>	Coastal Pelagics Management Board; Cobia Technical Committee, Plan Development Team, and Plan Review Team; South Atlantic Species Advisory Panel

The Atlantic States Marine Fisheries Commission (ASMFC) adopted an [Interstate Fishery Management Plan \(FMP\)](#) for the Atlantic Migratory Group of cobia (Atlantic cobia) in 2017 (ASMFC, 2017). Prior to the FMP, federal management was through the South Atlantic Fishery Management Council's (SAFMC) Fishery Management Plan for Coastal Migratory Pelagic Resources (CMP FMP), while New York, New Jersey, Delaware, Virginia, North Carolina and South Carolina had regulations for their respective state waters.

The FMP established a complementary management approach between the ASMFC and SAFMC. Under the ASMFC, Atlantic cobia are managed as part of the Coastal Pelagics Board (Board). Through the FMP, regulations for states with a declared interest were required to reflect several measures established federally through the CMP FMP.

In March, 2019, [Regulatory Amendment 31](#) to the CMP FMP became effective (SAFMC, 2018). This removed Atlantic cobia from the CMP FMP, resulting in management solely through the ASMFC.

In August, 2019, the Board approved [Amendment 1](#) to reflect removal of Atlantic cobia from the CMP FMP, assume management responsibilities previously accomplished through the SAFMC and CMP FMP, and establish recommendations for measures in federal waters. Amendment 1 stated requirements were to be implemented by July, 2020.

Amendment 1 maintains many regulations of the original Commission FMP and previous CMP FMP. These include a 36-inch fork length (or 40-inch total length) recreational minimum size limit, 1 fish per person recreational bag limit, a recreational daily vessel limit not to exceed 6 fish per vessel, a 33-inch fork length (or 37-inch total length) commercial minimum size limit, and a commercial possession limit of 2 cobia per person not to exceed 6 cobia per vessel.

There are four plan objectives:

- 1) Provide a flexible management system to address future changes in resource abundance, scientific information, and fishing patterns among user groups or areas.

Draft for Board Review

- 2) Promote cooperative collection of biological, economic, and social data required to effectively monitor and assess the status of the cobia resource and evaluate management efforts.
- 3) Manage the cobia fishery to protect both young individuals and established breeding stock.
- 4) Develop research priorities that will further refine the cobia management program to maximize the biological, social, and economic benefits derived from the cobia population.

In February, 2020, the Board approved an annual total harvest quota of 80,112 fish for 2020-2022, based on results from the Southeast Data, Assessment, and Review (SEDAR) 58 stock assessment for Atlantic cobia, allocated to the recreational and commercial sectors based on the Amendment 1 allocation of 92% recreational and 8% commercial. However, states with commercial harvest had an agreement to harvest a smaller portion of that amount in 2020. SEDAR 58 used updated recreational catch estimates from the Marine Recreational Information Program's (MRIP) 2018 transition and calibration to the mail-based Fishing Effort Survey effort estimates, which replaced those of the Coastal Household Telephone Survey.

Given the increased recreational catch estimates used in the SEDAR 58 assessment, the total annual quota approved by the Board also increased, resulting in increases to both the recreational and commercial quotas. As this increase in recreational harvest did not truly reflect a change in previous effort, only the estimate of that effort, [Addendum I to Amendment 1](#) was approved by the Board in October 2020 to reconsider the percent allocations to the commercial and recreational sectors to better reflect the observed harvest. The Addendum changed the allocation of the resource between the recreational and commercial fisheries from 92% and 8%, respectively, to 96% and 4%, respectively. The calculation of the commercial trigger, which determines when an in season coastwide commercial closure occurs, was also revised. The Addendum established a commercial *de minimis* set aside of 4% of the commercial quota with a maximum cap of 5,000 pounds to account for potential landings in *de minimis* states not tracked in-season against the quota. The Addendum also allowed states that are *de minimis* for their recreational fisheries to choose to match the recreational management measures implemented by an adjacent non-*de minimis* state (or the nearest non-*de minimis* state if none are adjacent) or limit their recreational fishery to 1 fish per vessel per trip with a minimum size of 33 inches fork length (or an equivalent total length of 37 inches). Based on maturity data from the SEDAR 58 assessment, this latter regulatory option was updated from 29 inches fork length to 33 inches fork length in Addendum I to allow a greater number of females to spawn before being susceptible to harvest. Addendum I measures were effective January 1, 2021.

In May 2022, the Board changed the cobia quota timeframe from 2020-2022 to 2021-2023, thereby, maintaining the total harvest quota of 80,112 fish for the 2023 fishing season. Per the Addendum I allocation of 96% for the recreational sector, the coastwide recreational harvest target for 2021-2023 fishing seasons is 76,908 fish and results in the following state-specific soft targets:

Georgia - 7,229 fish
South Carolina - 9,306 fish
North Carolina - 29,302 fish
Virginia - 30,302 fish
De minimis - 769 fish

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Per the Addendum I allocation of 4% to the commercial sector, the commercial fishery has a coastwide commercial quota of 73,116 pounds (3,204 fish) annually for the 2021-2023 fishing seasons. The current management measures for the commercial fishery include a 33" FL minimum size limit and 2 fish limit per person, with a 6 fish maximum vessel limit. The commercial Atlantic cobia fishery will close once the commercial quota is projected to be reached.

The Board will meet in 2023 to consider setting new specifications for the 2024-2026 fishing seasons.

II. Status of the Stock

SEDAR 58

In 2020, the Board approved the SEDAR 58 Atlantic Cobia benchmark assessment for management use which continued to use the Beaufort Assessment Model (BAM), a forward-projecting statistical catch-at-age model used in the prior assessment, SEDAR 28 (SEDAR 2013). SEDAR 58 provided new reference points and determined that the stock is not overfished and overfishing is not occurring (Figures 1 and 2). This assessment had a terminal year of 2017, and used the recalibrated recreational catch data from MRIP, which yielded much higher biomass and spawning stock biomass estimates as compared to SEDAR 28 (Figure 3). Even with the large changes in biomass estimates, the trends of abundance, recruitment, and relative status were very similar between the two assessments. Stock structure also remained unchanged from the SEDAR 28 assessment which established the stock boundary between Atlantic and Gulf of Mexico cobia at the FL/GA border with the Atlantic stock extending northward to Rhode Island.

Updated Reference Points

The assessment proposed updated reference points of $F_{40\%}$ and 75% of $SSB_{F_{40\%}}$ as the threshold reference points (Figures 4 and 5). The reference points were selected as the fishing rate and SSB that allows the population to reach 40% of the maximum spawning potential the stock would have obtained in the absence of harvest. These reference points serve as proxies for maximum sustainable yield-derived relationships due to insufficient data for cobia.

Status of the Stock and Fishery

Spawning stock biomass showed little overall trend throughout the estimated time series, but the terminal year is the lowest in the time series. Age structure estimated by the base run indicated a slight decline in the number of younger fish in the last decade, but the rest of the age structure was above the expected values in 2017. The estimated fishing mortality rates have generally increased through the assessment time frame, peaking in 1996, with the recreational fleet as the largest contributor to total F ($F_{2015-2017}/F_{40\%} = 0.29$).

III. Status of the Fishery

Regulations, by state, for the 2021 fishing year are presented in Table 1. Total Atlantic cobia landings are estimated at about 2.7 million pounds in 2021, which is a 13% increase from 2020 (Figure 6, Tables 2 and 3). The commercial and recreational fisheries harvested 2.5% and 97.5% of the 2021 total, respectively.

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Commercial landings of Atlantic cobia in 2021 span from Rhode Island through Georgia (Table 2). Coastwide commercial landings show an increasing trend since low harvests in the 1970s and early 1980s but comprise a small portion of the total harvest due, in part, to the current 4% allocation of the total annual harvest quota (Figure 6); the commercial allocation was 8% in 2019 and 2020. Coastwide cobia commercial landings in 2021 were estimated at 66,499 pounds. North Carolina (44%) and Virginia (44%) harvested the majority of the commercial landings (Table 2). The total non-*de minimis* commercial landings did not reach the commercial trigger level for fishery closure, so the commercial fishery in state waters remained open through the end of 2021.

Recreational harvests have fluctuated widely throughout the time series, often through rapid increases and declines. Average recreational harvest for the time series is 1 million pounds (Figure 6, Table 3) and about 38,000 fish (Figure 7, Table 4). This fishery has grown noticeably over the time series, with average harvests over the last 10 years of 2.1 million pounds and about 74,000 fish. The 2021 recreational harvest was 2.6 million pounds (90,807 fish). Virginia (66% of pounds, 63% of fish) and North Carolina (13% of pounds, 12% of fish) harvested the majority of recreational landings by pounds and number of fish. Average weight (recreational harvest in pounds divided by recreational harvest in numbers) in 2021 was 28.7 pounds per fish—a decrease by an average 1 pound per fish from 2020.

Per Addendum I, each state's recreational landings will be evaluated against state recreational harvest targets at the same time as the specification process, which will likely occur in 2023 when specifications are considered for 2024-2026.

Recreational releases of live fish have generally increased throughout the time series (Figure 7, Table 5). In 2021, 300,468 recreationally-caught fish were released, a 22% increase from 2020. Over the last five years 2017-2021, an average 79% of cobia caught recreationally were released alive each year. This is higher than the average 61% released alive during the previous five-year period of 2012-2016.

IV. Status of Assessment Advice

Current stock status information comes from SEDAR 58 (SEDAR, 2020), which determined the stock is not overfished and overfishing is not occurring. Results of this assessment were approved for management use by the Board at their February 2020 meeting, and, as such, have been incorporated into ASMFC's FMP.

The stock assessment could be improved by developing a fishery-independent sampling program for abundance of cobia and other coastal migratory pelagic species. The currently used fishery-dependent index causes notable uncertainty in part due to the lack of an effective sampling methodology. In addition, while the terminal year of the assessment was 2017, due to federal water closures, the index could only be calculated through 2015. The assessment could also benefit from improved characterization of age, reproductive, genetic, and migratory characteristics, tag-based information on natural mortality, and more precise recreational catch estimates.

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The next SEDAR stock assessment for the Atlantic cobia stock would be an operational (i.e., update) assessment tentatively scheduled for 2025. The terminal year would likely be 2023 or 2024 and the assessment would likely be available to inform 2026 management.

V. Status of Research and Monitoring

There are no monitoring or research programs required annually of the states except for the submission of a compliance report. Fishery-dependent data collections (other than catch and effort data) are conducted in Maryland, Virginia, North Carolina, South Carolina, and Georgia. Data collected includes length, age, and sex data. Fishery-independent monitoring programs conducted by states that may encounter cobia are conducted in New Jersey, Delaware, Maryland, South Carolina, and Georgia.

VI. Status of Management Measures and Issues

Fishery Management Plan

Some states implemented new recreational cobia measures in 2021 based on Addendum I. As approved by the Board, Virginia and North Carolina changed their measures after evaluation of previous landings against their new Addendum I recreational harvest targets. Virginia's 2021 measures were designed to reduce recreational harvest by 42% by lowering the vessel limit from 3 fish to 2 fish, and shortening the season by 30 days (changed to June 15-September 15).

North Carolina liberalized their measures in 2021 based on their harvest target, and the vessel limit was increased for private anglers only to allow 2 cobia per vessel per day in June (previously only allowed in May).

Some *de minimis* states also adjusted their 2021 recreational measures based on the updated *de minimis* requirement in Addendum I. Maryland and the Potomac River Fisheries Commission (PRFC) adjusted their vessel limit and season to maintain consistency with Virginia's, the nearest non-*de minimis* state to them.

New Jersey, Delaware, and Rhode Island have implemented the standard *de minimis* measures (1 fish per vessel/minimum size of 37 inches total length/no seasonal restrictions) rather than using the nearest non-*de minimis* state regulations. Rhode Island's measures were effective January 1, 2022 after joining the Board and declaring an interest in the cobia fishery in 2021.

In 2020, the South Carolina legislature codified the federal regulations for Cobia into the South Carolina Code of Laws. Prior to this, Cobia regulations (outside of the SCMZ) were covered by legal adherence to federal regulations for any species that did not have specific regulations in South Carolina law.

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De Minimis

For the recreational sector, the FMP requires adherence to state harvest targets, allocated to non-*de minimis* states from the total harvest quota allocated to the recreational sector. One percent of the quota is designated to account for harvest in *de minimis* states.

The FMP allows states to request recreational *de minimis* status if their recreational harvests (in pounds) in two of the previous three years are less than 1% of annual coastwide recreational landings during that time period. If a state qualifies for *de minimis*, the state may choose to match all FMP-related recreational management measures (including seasons and vessel limits) implemented by an adjacent non-*de minimis* state (or the nearest non-*de minimis* state if none are adjacent) or the state may choose to limit its recreational fishery to 1 fish per vessel per trip with a minimum size of 33 inches fork length (or 37 inches total length) with no seasonal restrictions. Rhode Island, New Jersey, Delaware, Maryland, and Florida requested recreational *de minimis* status through the annual reporting process. All of these states except Maryland meet the recreational *de minimis* qualifications.

Maryland in their compliance report acknowledged their recreational harvest was over the 1% recreational *de minimis* threshold in 2020 (1.7%) and 2021 (5.0%) after having zero landings in 2019. Given variability in landings year to year and that 2020 landings were close to the 1% threshold, Maryland requested to continue under recreational *de minimis* status for another year until 2022 recreational harvest can be evaluated.

De minimis status for commercial fisheries may be granted to states if their commercial landings for 2 of the previous 3 years were less than 2% of the coastwide commercial landings for the same time period. Commercial regulations in *de minimis* states are also limited to a minimum size of 33 inches FL with 2 fish per person for a total of 6 fish per vessel (the same requirements as non-*de minimis* states). Commercial *de minimis* states are not required to monitor their in-season harvests. Rhode Island, New Jersey, Delaware, Maryland, Georgia, and Florida requested *de minimis* status for commercial fisheries through the annual reporting process. All of these states except New Jersey meet the commercial *de minimis* qualifications.

New Jersey in their compliance report acknowledged their commercial harvest was over the 2% commercial *de minimis* threshold in 2019 (confidential) and 2021 (3.4%). New Jersey noted the landings in 2019 and 2021 are considered to be anomalously high compared to the past decade of landings which have previously qualified New Jersey for commercial *de minimis* status. New Jersey also noted their preliminary 2022 landings data are less than 20% of the landings during the same time in 2019 and 2021, and the 2% *de minimis* threshold is not anticipated to be exceeded in 2022. For these reasons, New Jersey requests to continue under commercial *de minimis* status for another year until 2022 commercial harvest can be evaluated. Additionally, New Jersey notes they will continue to work towards implementing mandatory in-season reporting of commercial cobia landings so that, should New Jersey's commercial cobia landings continue to consistently exceed the 2% threshold, the mechanism will be in place to maintain compliance with the FMP requirements.

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VII. Implementation of FMP Compliance Requirements for 2021

The PRT finds no inconsistencies among states in regards to the Fishery Management Plan.

VIII. Recommendations of the Plan Review Team

Management

The PRT recommends that the Board approve the 2022 FMP Review, state compliance, and all *de minimis* requests from Rhode Island, New Jersey, Delaware, Maryland, Georgia, and Florida.

The PRT agrees with the rationale provided by Maryland for their recreational fishery and New Jersey for their commercial fishery to continue under *de minimis* status until 2022 harvest can be evaluated next year. The PRT supports New Jersey's efforts to work toward building the mechanism for in-season commercial cobia monitoring given the potential for future landings to increase beyond the *de minimis* threshold.

The PRT emphasizes that multiple states could exceed *de minimis* thresholds over the next few years if cobia landings continue to increase in Mid-Atlantic states due to cobia potentially becoming more available in those areas. The PRT notes the management implications of this, including requiring commercial in-season monitoring in more states and adding new states to the calculation of state-specific recreational harvest targets. The PRT also notes the current allocation of recreational quota to each state is based on landings data through only 2015, which may need to be updated to reflect more recent years.

As the Board considers potential management action with the next set of specifications and with the next stock assessment, the PRT recommends the Board discuss whether updates to the state-by-state recreational harvest allocations are warranted.

Finally, the PRT noted New York's recent cobia commercial landings, which were 6.9% of coastwide commercial landings in 2020 and 2.4% in 2021. Considering these landings, the PRT recommends New York declare an interest in Atlantic cobia and update their cobia regulations for 2023 to at least meet requirements for *de minimis*. The PRT notes that in-season monitoring of New York's cobia landings may need to be implemented in the following years.

Research

The following are important research recommendations from the PRT:

Continue to collect and analyze current life history data from fishery independent and dependent programs, including full size, age, maturity, histology workups and information on spawning season timing and duration. Increase spatial and temporal coverage of age samples collected regularly in fishery dependent and independent sources. Continue collection of genetic material to continue to assess the stock identification and any Distinct Population Segments that may exist within the management unit relative to recommendations made by the SEDAR 58 Stock ID Process.

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Define, develop, and monitor adult and juvenile abundance estimates through the expansion of current or development of new fishery independent surveys.

Expand existing fishery independent surveys in time and space to better define and cover cobia habitats, including conducting otolith microchemistry studies to identify regional recruitment contributions and new and ongoing satellite tagging programs to help identify spawning and juvenile habitat use and regional recruitment sources. Additional work to better understand the impacts of climate change on cobia habitat and range expansion.

Additional research recommendations can be found in Section 2.8 of the [SEDAR 58 stock assessment](#).

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IX. References

ASMFC. 2017. Interstate Fishery Management Plan for Atlantic Migratory Group Cobia. ASMFC, Arlington, VA. 85 p.

SAFMC. 2018. Amendment 31 to the Fishery Management Plan for Coastal Migratory Pelagics Resources in the Gulf of Mexico and Atlantic Region. NOAA Award # FNA10NMF441001. Charleston, SC. 209 pp.

SEDAR. 2013. SEDAR 28 – South Atlantic Cobia Stock Assessment Report. SEDAR, North Charleston SC. 420 pp. available online at:
http://www.sefsc.noaa.gov/sedar/Sedar_Workshops.jsp?WorkshopNum=28

SEDAR. 2020. SEDAR 58 – Atlantic Cobia Stock Assessment Report. SEDAR, North Charleston SC. 500 pp. available online at: <http://sedarweb.org/sedar-58>

X. Figures

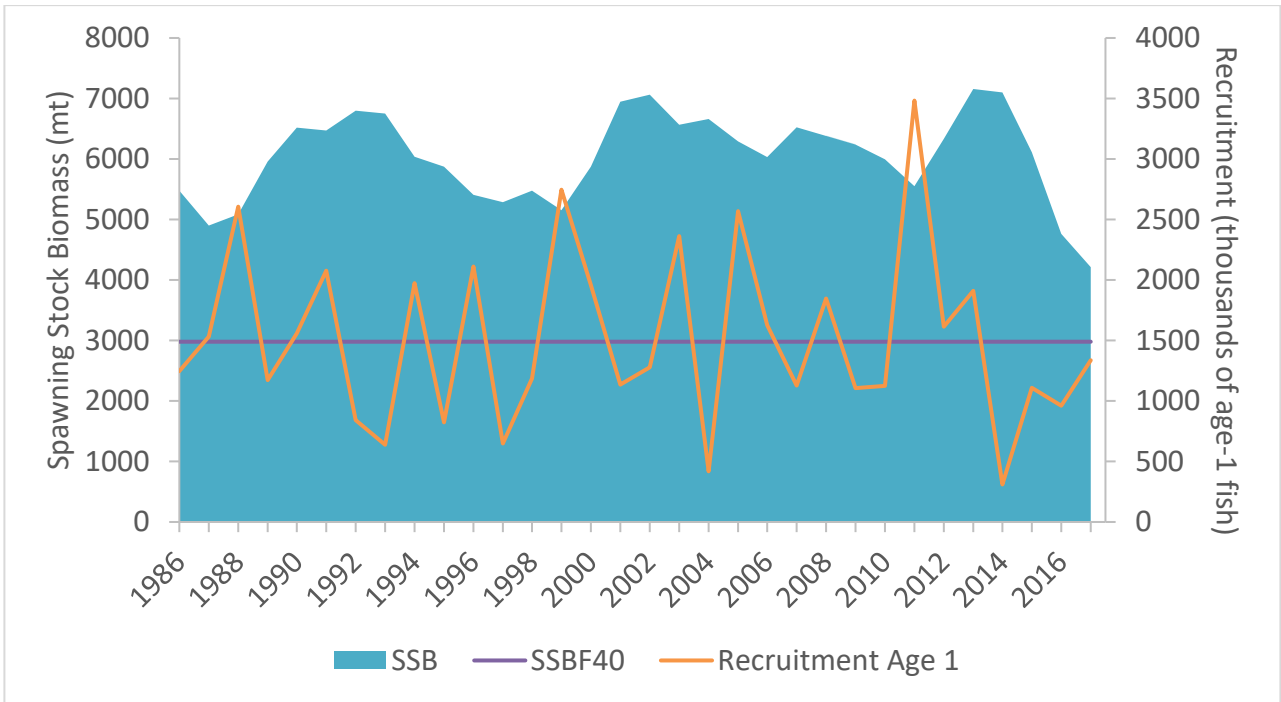


Figure 1. Atlantic Cobia spawning stock biomass (SSB) and recruitment of year 1 fish. (SEDAR, 2020)

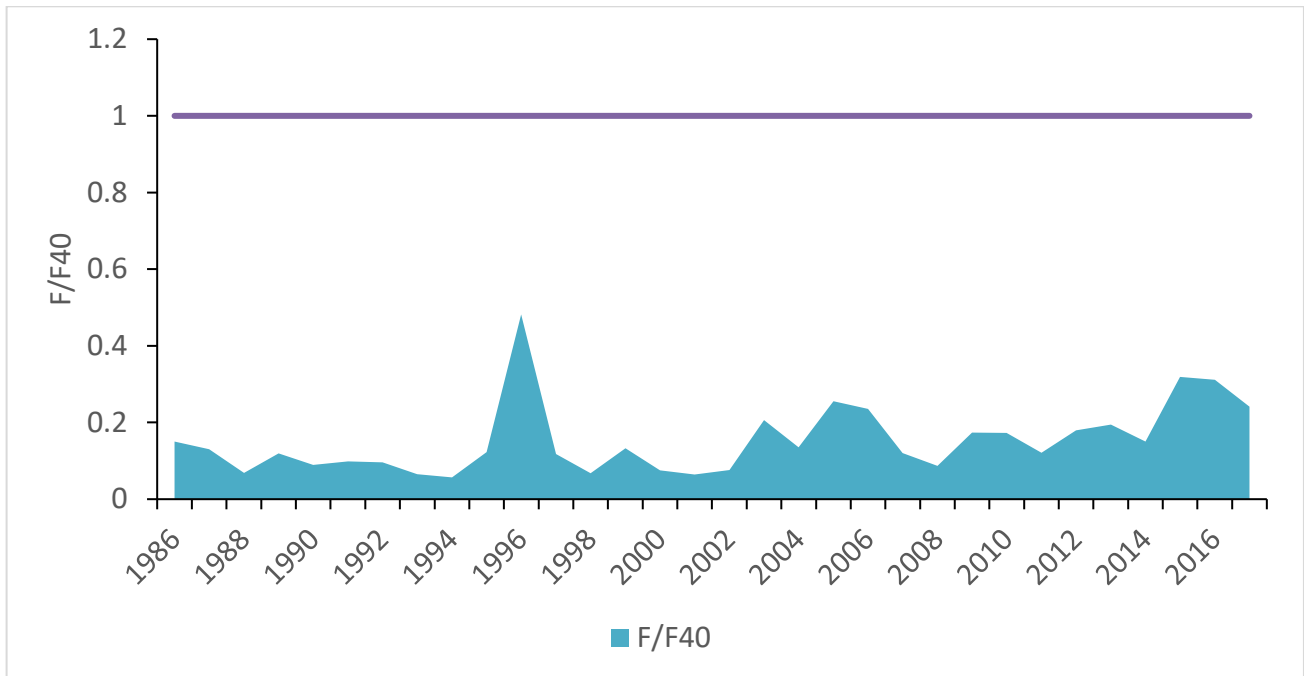


Figure 2. Atlantic Cobia fishing mortality (F) relative to the F40 reference point from 1986-2017. (SEDAR, 2020)

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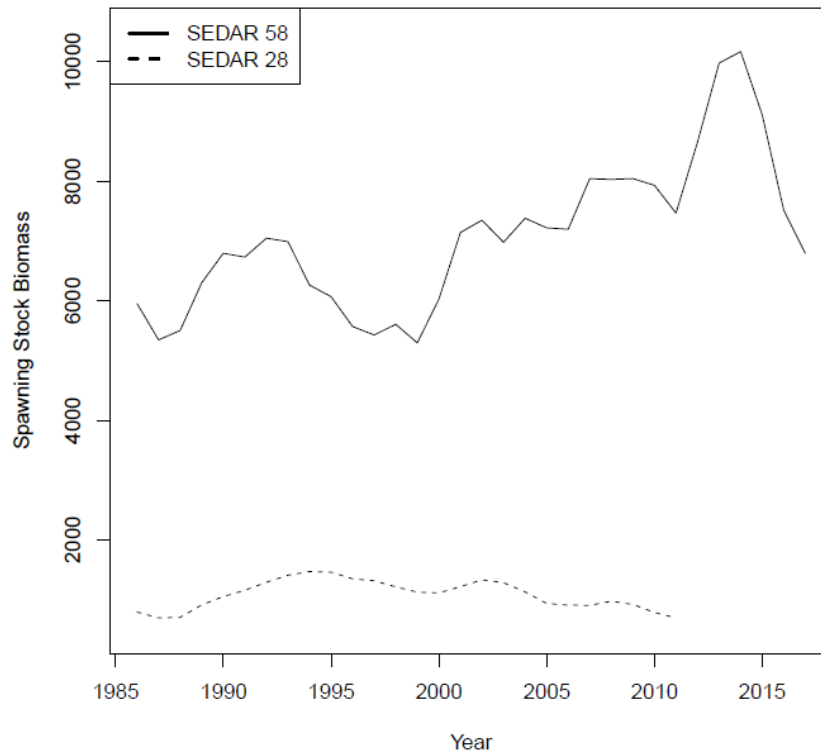


Figure 3. Comparing spawning stock biomass from the current assessment (SEDAR 58) to the last assessment (SEDAR 28). (SEDAR, 2020)

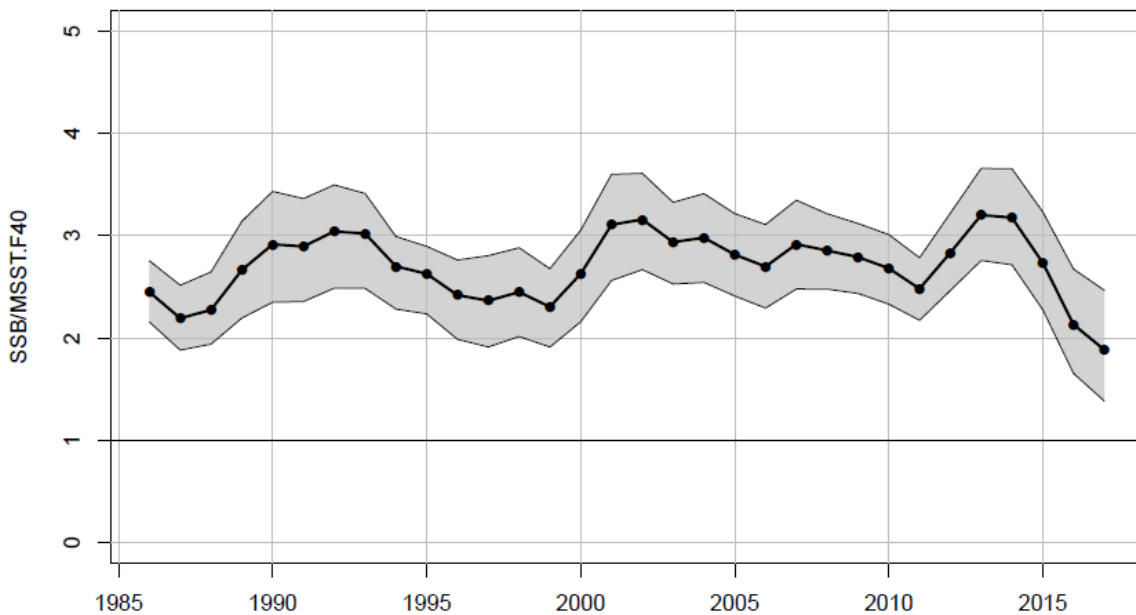


Figure 4. Estimated time series of Spawning Stock Biomass (SSB) relative to the Minimum Stock Size Threshold (MSST) (SEDAR, 2020).

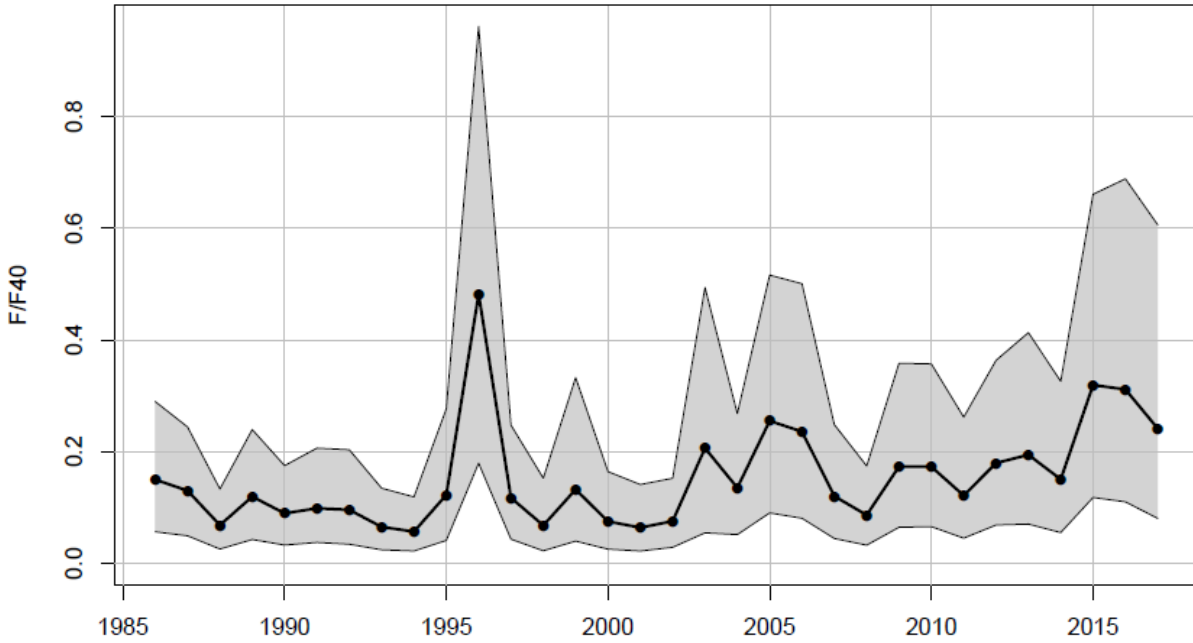


Figure 5. Estimated time series of Fishing Mortality (F) relative to F at Maximum Sustainable Yield (F_{40%}) (SEDAR, 2020).

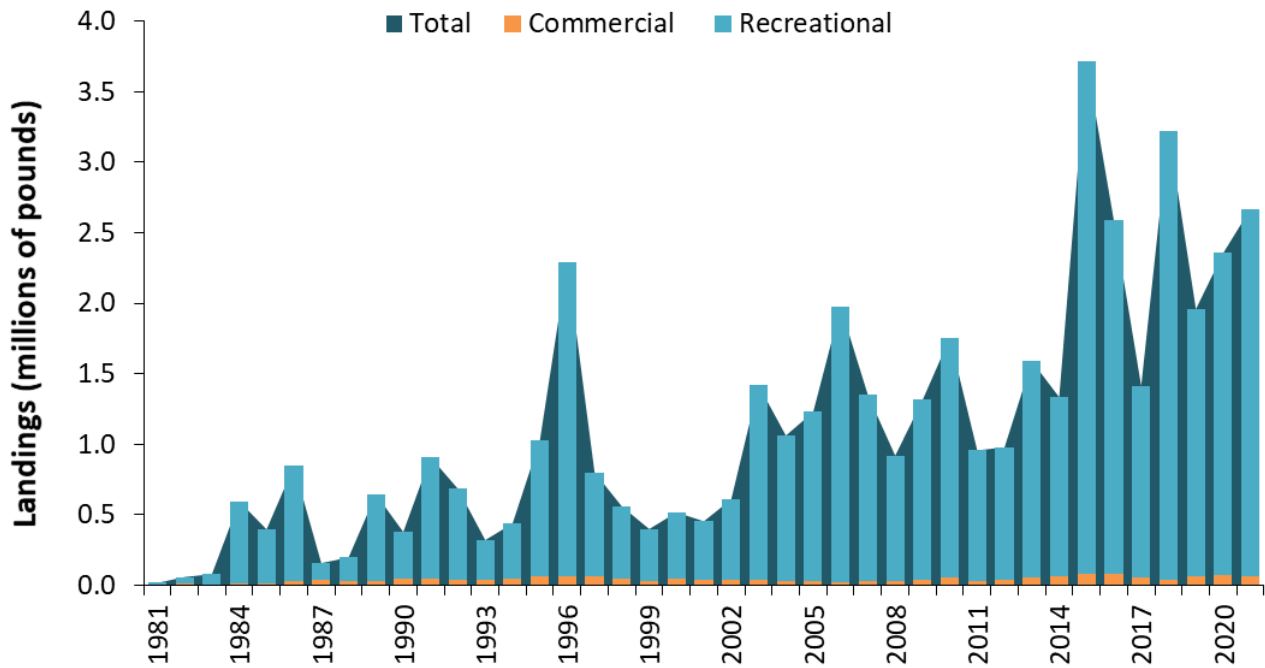


Figure 6. Commercial and recreational landings (pounds) of Atlantic cobia. Recreational data not available prior to 1981. See Tables 2 and 3 for data sources and values from the last ten years.

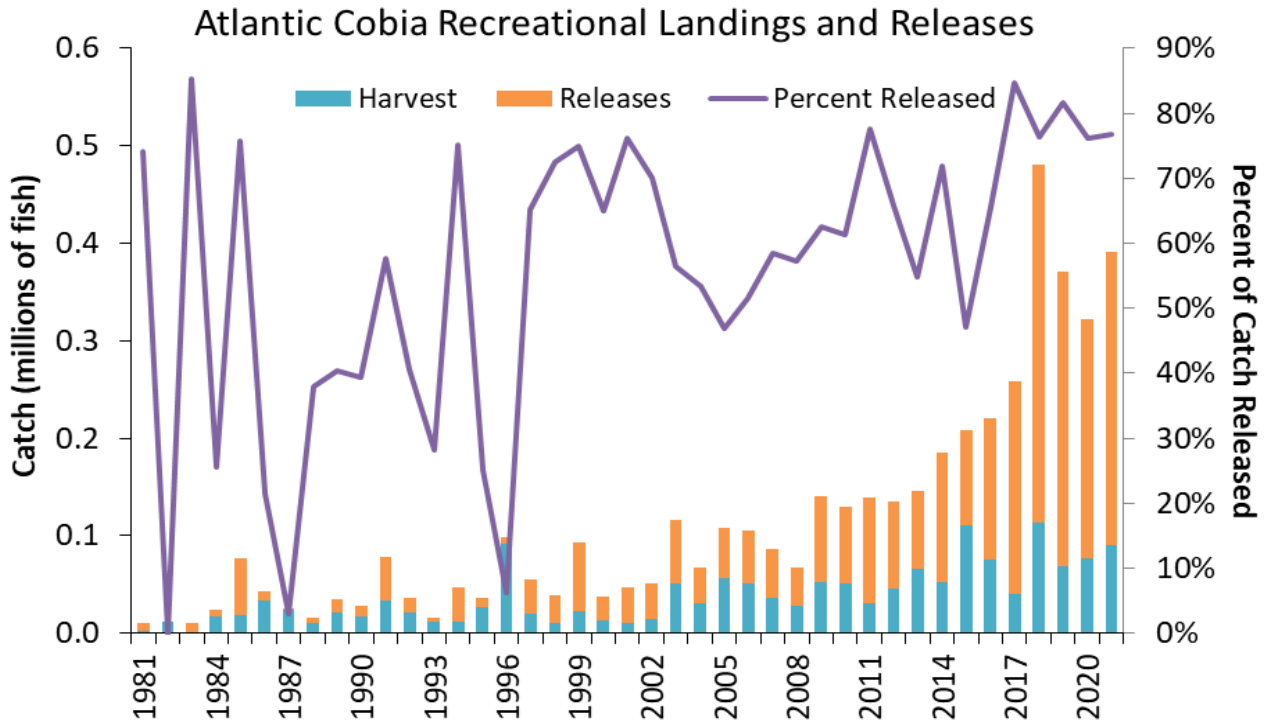


Figure 7. Recreational catch (harvest and live releases) of Atlantic cobia (numbers) and the proportion of catch that is released. See Tables 4 and 5 for data sources and values from the last ten years.

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XI. Tables

Table 1. Atlantic cobia regulations for 2021.

State	Recreational Measures	Commercial Measures
RI	<i>De minimis</i> Minimum Size: 37 in total length Vessel Limit: 1 fish per vessel Season: year-round	<u>Coastwide</u> Possession Limit: 2 fish per person Minimum Size: 33 in fork length or 37 in total length Vessel Limit: 6 fish If commercial fishing in state waters is closed, commercial fishing in federal waters will be recommended to mirror state closures <u>Deviations</u> -Rhode Island possession limit is 2 fish per vessel -Virginia possession limit is per licensee rather than per person -North Carolina has 36 minimum fork length -No commercial harvest in South Carolina state waters -Georgia possession limit is 1 fish per person (not to exceed 6 per vessel) and minimum size is 36 in fork length
NJ	<i>De minimis</i> Minimum Size: 37 in total length Vessel Limit: 1 fish per vessel Season: year-round	
DE	<i>De minimis</i> <u>1/1/2021 through 9/10/2021</u> Minimum Size: 40 in total length Bag limit: 1 fish per person Vessel Limit: 3 fish per vessel Season: June 1-September 15 <u>New regulations effective 9/11/2021</u> Minimum Size: 37 in total length Bag Limit: 1 fish per vessel Vessel Limit: 1 fish per vessel	
MD	<i>De minimis</i> Minimum Size: 40 in total length Bag Limit: 1 fish per person Vessel Limit: 2 fish per vessel Season: June 15-September 15	
PRFC	Minimum Size: 40 in total length (only 1 fish over 50" per vessel) Bag limit: 1 per person Vessel Limit: 2 fish per vessel Season: June 15-September 15	
VA	Minimum Size: 40 in total length (only 1 fish over 50" per vessel) Bag Limit: 1 fish per person Vessel Limit: 2 fish per vessel Season: June 15-September 15	

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NC	<p>Minimum Size: 36 in fork length Bag Limit: 1 fish per person Season: May 1-December 31 <u>Private Vessel Limit</u> May 1- June 30: 2 fish July 1-Dec 31: 1 fish</p> <p><u>For-Hire Vessel Limit</u> May 1-Dec 31: 4 fish</p>	
SC	<p>Bag Limit: 1 fish per person Minimum Size: 36 in fork length Vessel Limit: 6 fish Season: Open year-round</p> <p><u>Southern Cobia Management Zone:</u> Minimum Size: 36 in FL Season: June 1-April 30 (closed in May) Bag Limit: 1 fish per person Vessel Limit: 3 fish</p> <p>-If recreational fishing in federal waters is closed, recreational fishing in all SC state waters is also closed.</p>	
GA	<p>Bag Limit: 1 fish per person Minimum Size: 36 in fork length Vessel Limit: 6 fish Season: March 1-October 31</p>	
<p>*Florida has a declared interest in the Atlantic Coastal Migratory Group, but their cobia fisheries are managed as part of the Gulf of Mexico Migratory Group due to cobia stock boundaries.</p>		

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Table 2. Commercial landings (pounds) of Atlantic cobia by state, 2012-2021. (Sources: 2022 state compliance reports for 2021 fishing year; for years prior to 2021, personal communication with Atlantic Coastal Cooperative Statistics Program [ACCSP], Arlington, VA)

Year	CT*	RI	NY*	NJ	DE	MD	PRFC	VA	NC	SC	GA	Total
2012		217	152	699		C		5,382	31,972	3,359	C	C
2013		476	840	885	C	C		10,900	35,456	3,829	C	53,177
2014		C	311	359		C		21,255	41,798	3,492	C	68,076
2015		C	235	C		C		25,352	52,684	2,487	C	82,117
2016		183	114	282	C	C		29,459	48,244	4,064	C	83,583
2017		115	80	C	C	C		26,748	16,890	4,261	C	52,376
2018	C	290	388	707		C		21,355	16,578	2,723	C	42,711
2019		352	1,191	C	C	C	2,375	33,496	21,553	2,673	C	63,467
2020	C	844	5,183	851	C	C	378	27,768	38,344	1,588	C	75,303
2021	C	797	1,581	2,273		C	816	29,425	29,301	2,067	C	66,499

C: confidential landings.

*CT and NY do not have a declared interest in Atlantic migratory cobia.

Table 3. Recreational harvest (pounds) of Atlantic cobia by state, 2012-2021. Values shown are the new MRIP numbers. (Sources: 2022 state compliance reports for 2021 fishing year; for years prior to 2021, personal communication with MRIP queried June 2022)

Year	RI	NY	NJ	DE	MD	VA	NC	SC	GA	Total
2012			60,473			47,547	102,077	214,512	512,499	937,108
2013						488,181	980,541	24,005	43,915	1,536,642
2014						499,218	645,427	79,171	42,481	1,266,297
2015						1,166,000	1,925,762	434,899	102,917	3,629,578
2016					307	1,505,528	838,363	159,345		2,503,543
2017						488,287	872,861		390	1,361,538
2018				15,053	4,647	2,259,661	685,962	205,647	6,081	3,177,051
2019						1,573,485	254,963	64,937	1,632	1,895,017
2020					38,991	1,541,393	407,883	247,250	44,976	2,280,493
2021			6,060		131,129	1,722,619	356,340	217,129	170,356	2,603,633
% Imputed Data 2020					4%	78%	88%	7%	1%	

Table 4. Recreational harvest (numbers of fish) of Atlantic cobia by state, 2012-2021. Values shown are the new MRIP numbers. (Sources: 2022 state compliance reports for 2021 fishing year; for years prior to 2021, personal communication with MRIP queried August 2022)

Year	RI	NY	NJ	DE	MD	VA	NC	SC	GA	Total
2012			18,287			1,429	3,805	7,626	15,104	46,251
2013						24,145	37,617	1,580	2,638	65,980
2014						21,585	24,601	3,883	2,168	52,237
2015						38,672	47,110	15,575	8,934	110,291
2016					56	43,780	26,421	5,437		75,694
2017						14,613	25,025		19	39,657
2018				581	206	80,679	25,331	6,340	233	113,939
2019						55,770	10,090	2,381	72	68,313
2020					1,360	50,287	15,067	7,650	2,203	76,786
2021			250		5,084	57,135	10,970	8,858	8,510	90,807
% Imputed Data 2020										
					6%	76%	88%	8%	1%	

Table 5. Recreational live releases (numbers of fish) of Atlantic cobia by state, 2012-2021.
Values shown are the new MRIP numbers. (Sources: 2022 state compliance reports for 2021 fishing year; for years prior to 2021, personal communication with MRIP queried August 2022)

Year	RI	NY	NJ	DE	MD	VA	NC	SC	GA	Total
2012			178			17,184	66,567	4,404	383	88,716
2013						35,731	35,398	7,438	1,577	80,144
2014						58,092	32,184	42,811		133,087
2015			416			40,689	44,254	12,369	283	98,011
2016					1,075	81,482	39,237	20,255	2,917	144,966
2017						77,184	125,251	11,359	4,830	218,624
2018			2,879		12,090	194,865	68,219	71,020	18,056	367,129
2019			10,166	30	251	184,716	38,285	59,724	9,080	302,252
2020		2,979		564	8,233	146,913	51,158	23,384	15,091	245,343
2021				197	12,344	187,872	40,136	39,341	20,578	300,468
% Imputed Data 2020										
				0%	2%	74%	62%	1%	17%	

Atlantic States Marine Fisheries Commission

East Coast Climate Change Scenario Planning Initiative Workshop

November 8, 2022

1:30 – 5:00 p.m.

Hybrid Meeting

1. Introduction, Background, and Purpose of Workshop (*J. Star, T. Kerns*) 1:30 p.m.
2. Description and Discussion by Scenario 1:45 p.m.
 - Do you agree with/recognize the challenges, opportunities and possible actions for each scenario?
 - What else is important to note about each scenario that is not yet covered? What would you add?
3. Polling Questions 2:45 p.m.
 - Which scenario is closest to describing the situation as you see it today?
 - Which scenario do you believe is most likely to play out by 2042?
4. Public Comment 2:50 p.m.
5. Break 3:00 p.m.
6. Recurring Ideas and Main Takeaways 3:15 p.m.
 - Looking across all scenarios, what issues emerge that require further discussion?
 - Cover each of the management themes in turn: cross-jurisdictional governance, data & science, alternative ocean uses, adaptability
 - Are there any issues (outside the four theme areas) that we should also include in further conversations (e.g., Summit)?
7. Key Discussion Topics for the Summit Meeting 4:00 p.m.
 - What are the big questions that this conversation raises for ASMFC that you would like to see addressed at the Summit meeting?
 - What are the big questions this raises for East Coast fishery management in general (i.e., all Councils/Commission) that you'd like to see addressed at the Summit meeting?
 - What specific recommendations would you propose be considered at Summit?
 - As we prepare for the Summit Meeting, what should the Core Team be mindful of?
8. Public Comment 4:50 p.m.
9. Adjourn 5:00 p.m.

The meeting will be held at The Ocean Place Resort (1 Ocean Boulevard Long Branch, NJ; 732.571.4000) and via webinar; click [here](#) for details

East Coast Climate Change Scenario Planning

Implications and Preliminary Ideas for Fishery Management

October 2022

1. Introduction

The East Coast Scenario Planning Initiative has engaged hundreds of stakeholders in conversations about how climate change might affect the future of fishery management on the East Coast. In recent months, participants have settled on a framework creating four scenarios, each describing a different future that fishery managers and others might face.

Based on the scenario matrix, the four stories were distinguished by two critical uncertainties. The horizontal uncertainty described the difference between a future of unpredictable conditions (where science struggled to provide adequate information) and a future of predictable conditions (where science proved adequate to inform fishery management and other decision-making). The vertical uncertainty described the difference between a future where stocks (in aggregate) were maintained or increasing, and a future where stocks were declining.

The Initiative is now in the Application phase, where we apply the scenarios to help (i) identify the consequences for future fishery governance and management and (ii) suggest recommendations for changes to existing approaches or arrangements.

This Application phase began with a series of three brainstorming sessions, bringing together a cross-section of representatives from participating management organizations. Participants were asked to consider the specific challenges and opportunities that each scenario poses for fishery managers, and then asked to generate ideas for possible changes and actions that are needed for fishery governance and management to be effective in the future. The purpose of these sessions was not to reach conclusions. Instead, it was to identify *preliminary* ideas that will help kick off scenario discussions at Council and Commission meetings in Fall 2022, and subsequently at a Summit Meeting in early 2023.

This report provides a summary of comments and reactions gathered when discussing each scenario. In the manager brainstorming sessions, we divided comments across four main thematic areas: (i) cross-jurisdictional governance and management, (ii) data and science, (iii) alternative ocean uses, and (iv) adaptability. The summary starts with a brief overview using the matrix structure. This is followed by more detailed ideas per scenario. The comments are then followed by some analysis of common themes and issues that appeared relevant across multiple scenarios. These recurring themes are important to capture, since they often represent the most important issues that need to be addressed as they are likely to emerge no matter which scenario occurs in the future.

East Coast Climate Change Scenario Planning

Implications and Preliminary Ideas for Fishery Management

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2. Ideas and Reactions by Scenario

Below is an outline of preliminary challenges, opportunities and options for each scenario that were generated in the manager brainstorming sessions. The following pages contain more detail for each scenario.

Ocean Pioneers

A future of unpredictable conditions and maintained / increasing stocks

- Climate change creates governance 'turf wars', requiring organizations to compromise on jurisdictional control
- Without accurate information, decisions might be made on a more qualitative basis
- Current stock assessment process unlikely to work, and could prompt moves towards simpler harvest control rules
- Vessels and new ocean users offer opportunities for fish & environmental data collection

Checks and Balance

A future of relatively predictable conditions and maintained / increasing stocks

- Focus on access and participation from small fleets and low-income recreational fishermen
- Focus on joint management of stocks rather than switching from one management body to another
- More emphasis on new technology, biological sampling in ports
- Consider how new ocean users have a seat at the table

Compound Stress Fractures

A future of unpredictable conditions and declining stocks

- Consider managing spatially or by species, or both?
- Give specialized fishermen the opportunity to move up & down coast; allow fixed fishermen to move from one species to another
- Consider how to respond when previously reliable indices for managed species are no longer reliable
- Collaborate with other users for real-time monitoring

Sweet & Sour Seafood

A future of predictable conditions and declining stocks

- Informally work through solutions to determine best approaches before formalizing changes too quickly
- Deliberately make strategic choices around declining stocks
- Further develop climate-informed status reports like State of the Ecosystem / Vulnerability Assessments
- As aquaculture products increase in popularity, increase efforts to market wild-caught seafood

Ocean Pioneers

Cross-Jurisdictional Governance & Management

- Current governance structure will not work well in this scenario
- Climate change is creating a governance turf war, particularly between Councils
- Species or trophic level boards/teams may work better than regional management bodies
- Move away from state-by-state management
- Challenging to balance community level considerations against regional/national benefit
- Consider how to have more interaction and collaboration between management bodies
- Balance against challenge of too many participants leading to cumbersome and slow processes
- Governance model needed that can more easily adapt to fluctuating conditions
- Increased flexibility needed for permitting/landing: who can land the fish and where
- Need better/more creative ways to link emerging science with management strategies such as allocations
- States have less resources available to adapt and would rely on ASMFC process more
- If science can't keep up with stock shifts, how do we decide who should manage them?
- Organizations are going to have to prepare to compromise on jurisdictional control

Adaptability

- Need to address bureaucratic factors that slow down process; determine where efficiency can be gained
- Continued virtual meetings are a potential way to increase efficiency
- Need transparency and public input, but need to find a way to make that process more efficient
- Managers will need tools to make decisions with less information/certainty (e.g., more management strategy evaluation; simulation tested control rules)
- Managers may also need to make some decisions on more of a qualitative basis
- Simple management strategies may work better than complex plans
- Communication may need to adapt to manage public expectations
- Commercial fleet likely would shift to larger vessels and processing at sea

Data and Science

- Our current stock assessment process will not work given fluctuating and unpredictable conditions; much too slow and cumbersome
 - Assessment metrics may also need to change
 - Might need to move toward simpler Harvest Control Rules
- Increased data (on fish and environmental conditions) needed from fishing industry and other sources
- New data sources must be able to be incorporated into management process quickly
- Artificial intelligence could produce advice more rapidly
- Need better spatial recreational data; current surveys inadequate to detect shifts
- More recreational catch accounting in general will be needed
- Fishery independent surveys will need to change to better capture species shifts
- Science that does not align with perceptions/experiences on the water will pose challenges for managers
- If public sees that science is not well informing management process, will be difficult to sustain funding
- Current science structure is framed around current management structure: will need rethinking if governance system changes

New Ocean Uses

- Leverage new ocean uses as an opportunity for fish and environmental data collection
- Need for better spatial data to help with planning and evaluation of new ocean uses
- Consider deconflicting proactively through ocean zoning
- Recreational shore access needs to be actively maintained as other ocean uses increase activity on shore

Compound Stress Fractures

Cross-Jurisdictional Governance & Management

- Consider managing spatially, not by species, or a combination of the two
 - Both domestically and internationally
- Work with foreign entities to figure out how to bring fish back home
- Increase participation in committees and liaisons on other Councils
 - Allow these members to vote
- Be more inclusive of all states in management decisions
- Focus on accurate, clear communication to mitigate frustration

Adaptability

- Permit system could be adapted to allow fishing what is available instead of species-based
- Reduce timeframe for actions (many actions currently take 2+ years)
- Give states the ability to transfer quota based on who needs it year-by-year
- Reevaluate rebuilding guidance based on new environmental conditions
- Either give specialized (by species) fishermen the ability to move up and down the coast or allow fixed (by location) fishermen to move from one species to another
- Create a permit system that allows fishermen to easily change gear types
- Consider if triggers/pre-determined decision rules can streamline development of fishery management actions
- Consider reducing effort in fair and equitable ways

Data and Science

- Move towards real-time monitoring feeds instead of surveys
- Collaborate with wind and aquaculture on monitoring
- Shift focus to problematic areas
- Work towards continued availability of funding for surveys that represent long time series and/or are critical for stock assessments
- Understand species' habitat needs are, and what habitat bottlenecks might be as species distributions shift
- View as an opportunity to collaborate with fishing industry on data collection
- Ensure that science used for management is representative of conditions on the water
- Create flexibility to use new data sources for management
- Streamline QA/QC so that data can be used more rapidly following collection
- Determine how to respond when previously reliable indices for managed species are no longer reliable
- Recognize that we might need more/higher resolution data to understand a variable system
- Work towards climate-informed assessments, projections, and status determinations
- Enhance existing trawl surveys to ensure that they address data needs
- Take advantage of offshore structures for wind and aquaculture as data collection platforms

New Ocean Uses

- Collaborate with real-time monitoring and reporting and increase communication between users

Sweet & Sour Seafood

Cross-Jurisdictional Governance & Management

- Clarify responsibilities for aquaculture permitting, and Council/Commission role and interest
- Craft strategies/policies for when a management response is needed due to shifting stocks
 - Consider federal/state issues and whether the shift is expected to be lasting or ephemeral; goal to avoid whiplash
- Need to develop clear/formulaic criteria for jurisdictional changes (i.e., shifting management of a species from one body to another, or enacting joint governance)
- Consider current adaptation strategies that should be continued/expanded and perhaps formalized
- Opportunity should be provided to more informally work through solutions to determine best approach before formalizing changes (e.g., through NMFS policy guidance or written agreements) too quickly
- Governance decisions are extremely tough when managers must make choices that could affect their own jobs/organizations
- Formulaic allocation methods based on distribution don't always account for historical social and economic importance
- Prohibit imports that do not meet US conservation standards
- Move from single species to ecosystem-based management
- Develop scheme where decision making is done by businesses (commercial or charter)

Adaptability

- Deliberately make strategic choices with declining stocks: for example, fleet contraction/reduction, or restrict effort across all current participants
- Consider new/increased utilization of species not previously fished, or occurring on the high seas
- Explicitly acknowledge that behavioral change (e.g., shifting towards harvesting and processing new species) is challenging
- Consider how much we let market forces vs management affect adaptation
- May need more international agreements as fish shift across borders
- Cultivate a culture of being more proactive instead of reactive

Data and Science

- Enhance/augment existing trawl surveys to ensure that they address data needs
- Take advantage of offshore structures for wind and aquaculture as data collection platforms
- Prioritize allocation of time/funds towards data collection to support increased science needs
- Increase collaborative data collection
- Improve coordination around NOAA surveys in different regions; standardize methods and design
- Focus on data storage and access
- Ensure assessment models are robust to new realities/variability in system; or develop new approaches
- Allocate resources strategically between fishery independent and dependent data collection
- Continue to advance and improve climate informed status reports like State of the Ecosystem Reports and Vulnerability Assessments
- Assessment techniques should include climate informed recruitment information

New Ocean Uses

- Educate consumers on how to appreciate and prepare seafood
- Behavioral change of watermen from fishing to aquaculture is difficult
- Engage in robust and data-driven spatial planning to better evaluate where to locate ocean activities
- Plan for how to integrate wild capture fisheries and aquaculture. One idea here might be planning for when aquaculture operations wish to culture council or commission managed species, and whether a regulatory response is needed from the commission and councils)
- As availability of aquaculture products increases, put effort into developing markets for wild-caught seafood to ensure survival of industry

Checks & Balance

Cross-Jurisdictional Governance & Management

- Focus on and modify joint management approaches to make sure all are represented
- Focus more on access and participation from small boat fleets and middle/lower class recreational fishermen or they may be lost
- Coordinate and work on coastal resiliency to address environmental justice issues and provide access and ensure access remains available
 - Note: increased access comes at a price; may drive up costs of fish making seafood less accessible
- Need clarity and guidance on when changes in distribution should lead to jurisdictional shifts in management
- Need to be mindful of current limited access rights and permit qualifications when making governance changes - removing access/rights may be a conundrum
- Need to consider flexibility in fishery permitting and access at federal and state level and in combination

Adaptability

- Maintain and increase shoreside access for anglers
- Focus on joint management of stocks as opposed to switching from one management body to another (i.e., one Council would have primary administrative authority in cooperation with other Councils)
 - Note: this could slow things down
- To understand new fisheries, we need data to understand what is there now to understand when there is a shift in distribution
- Use data to make more real-time decisions

Data and Science

- More emphasis on new tech, biological sampling in ports
- Work towards more efficiency in existing surveys since we are already struggling to maintain them, and resources are already limited

New Ocean Uses

- Collaborate and share data with other ocean users
- Consider ways to work with the commercial space industry to accommodate rocket launches. (I.e., closures 4-5 hours before and 1-2 hours after)
- Consider whether other ocean users will need a seat at the fishery management table, as advisors or otherwise, to allow for better collaboration
- Establish clear and consistent communication across sectors

3. Common Issues Across Scenarios

The following issues emerged as particularly important across multiple scenarios. This provides an initial list of some of the problems that fishery managers are faced with, and will need to address as climate change has an increasing impact of ocean and shoreside conditions:

- Challenges of the current cross-jurisdictional structure: particularly in unpredictable scenarios, participants recognized the **limitations of the current regional structure** and felt that it would be unlikely to work in the future. But setting up a structure that accommodates moving stocks is tricky. Groups considered whether species / trophic level structures might offer a more suitable approach in uncertain conditions. Or is there a way of managing by location, rather than species?
- Groups also talked through the **mechanics of changing management responsibilities**. Should formal rules and criteria be established to indicate when a species requires an alternative management approach, or should such transitions be decided informally? It will be important to establish approaches that create consistency/continuity and avoid whiplash.
- Managers will need to make **decisions with less clarity and certainty**. Will this involve more simulations and MSEs? Or can decision-making be achieved by devising simpler management strategies as opposed to more complex plans? What needs to be done to manage public expectations about decision-making in situations of inadequate information?
- Fishery management is sure to involve more **collaboration**. This might be across management bodies, international partners, or with new ocean users. How can we ensure more regular (and intensive) collaboration without it leading to cumbersome and time-consuming processes? Or can we envisage new processes that can accommodate new voices? And what is the purpose of collaboration? Is it to ensure that all are consulted as decisions are made? Or should fishery managers see more collaboration as a way of learning and innovating (e.g., new data sources, biological sampling, supplementing changes in fisheries production)?
- What's the suitable balance of **funding and attention in data and science**? Is it more important to maintain, or even expand, sample sizes and improve the efficiency of existing surveys (e.g., trawl surveys)? Or should more attention be placed on establishing new sources of data (e.g., real-time from vessels, collaboration with wind energy installations)? Should we consider how fishery surveys could gather additional environmental data?
- Our current **stock assessment processes and methods** may not work well in a world where more timely information is needed to ensure a management process that is

East Coast Climate Change Scenario Planning

Implications and Preliminary Ideas for Fishery Management

October 2022

nimble and responsive. Can we find ways to speed up stock assessment development and review processes? Are there assessment methods or other metrics that might allow for more real-time resource evaluation? How do we balance the desire to incorporate more data, ecosystem information, and climate information with the need to streamline the assessment process?

- There were recurring needs identified for **increased flexibility around permitting and landing**. Could there be movement towards a system of permitting fishing for what's available, rather than for particular species? Can specialized fishermen move up and down the coast? Is there a role for management to support adaptation of fishermen and communities or should this be left to market forces? Are there other ways management can support fisher adaptation?
- As the ocean gets busier, there were numerous calls to investigate **spatial planning and ocean zoning** to minimize conflicts. Improved spatial data was also referenced on numerous occasions. Are there opportunities to expand coordination and partnerships with new ocean users to ensure an orderly expansion of ocean users?
- As coastal areas get busier with people and commercial uses, fishery managers might have to get involved in **maintaining and increasing shoreside access and increased participation** for anglers, and more generally as a vehicle for environmental justice.

This list of "common issues" should serve as a broad agenda for discussion and action. It is a daunting list of challenges, many of which are long-standing and complex (and given climate change, the complexity and urgency is set to increase). This leads to a couple of implications:

- i. It will be important to identify some practical ways in which fishery managers can make progress and achieve some "quick wins" around these issues
- ii. Quick wins won't be enough. Fishery managers will need to consider new approaches (and new ways of thinking) to address these and other challenges in future. This might involve more flexible approaches to strategy and decision-making, such as imagining future scenarios, option generation, experimentation, and adaptability.

East Coast Climate Change Scenario Planning

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4. Forthcoming Council and Commission Discussions

The sections above provide a starting point for discussions at Councils and Commission in meetings in November and December. At those sessions, participants will be asked to:

- Review the ideas and reactions by scenarios (Section 2). Do you agree that the issues raised above are the most significant and relevant for this initiative? Are we missing any major issues, challenges or opportunities? What actions make sense to explore in each scenario?
- Review the Common Issues Across Scenarios (Section 3). Do you agree that the issues raised in this section are the most significant and relevant for this initiative? Are the issues, challenges and opportunities described accurately? As you think about what fishery managers will be facing given climate change in the years ahead, is this a good list? What would you add?
- Identify a short list of issues that you feel are particularly relevant for your organization, in that they comprise the most important factors that your organization needs to deal with.
- Propose recommendations about changes that should be discussed at the Summit meeting when representatives from all organizations will gather to agree on actions to pursue.
- Discuss the need to develop new approaches to flexible decision-making, such as option generation and experimentation.

Atlantic States Marine Fisheries Commission

Executive Committee

November 9, 2022

8:00 – 10:00 a.m.

Hybrid Meeting

Draft Agenda

The order in which these items will be taken is subject to change; other items may be added as necessary.

1. Welcome/Introductions (*S. Woodward*)
2. Board Consent
 - Approval of Agenda
 - Approval of Meeting Summary from August 3, 2022
3. Public Comment
4. Review and Consider Approval of FY2022 Audit **Action** (*J. Cimino*)
5. CARES Update (*R. Beal*)
6. Review Draft *De Minimis* Policy (*T. Kerns*)
7. Future Annual Meetings Update (*L. Leach*)
8. Other Business/Adjourn

The meeting will be held at The Ocean Place Resort (1 Ocean Boulevard Long Branch, NJ; 732.571.4000) and via webinar; click [here](#) for details

**DRAFT MEETING SUMMARY OF THE
ATLANTIC STATES MARINE FISHERIES COMMISSION
EXECUTIVE COMMITTEE**

**The Westin
Arlington, VA
August 3, 2022**

INDEX OF MOTIONS

1. Approval of Agenda by Consent. (Page 1)
2. Approval of Meeting Summary from May 4, 2022 by Consent. (Page 1)
3. Motion to approve the revised Investment Policy. (Motion by Ms. Patterson; seconded by Mr. Keliher; motion passed unanimously) (Page 1)
4. Motion to accept the proposed changes to the Commission's appeals process policy to be forwarded to the Policy Board for action. (Motion by Mr. Clark; second by Ms. Patterson. Motion passed unanimously.) (Page 1)
5. Adjourn by Consent (Page 1).

ATTENDANCE

Committee Members

Pat Keliher, ME
Cheri Patterson, NH
Dennis Abbott, NH (LA Chair)
Dan McKiernan, MA
Jason McNamee, RI
Justin Davis, CT
Jim Gilmore, NY
Joe Cimino, NJ
Kris Kuhn, PA

Roy Miller, DE (GA Chair)
John Clark, DE
Lynn Fegley, MD
Patrick Geer, VA
Kathy Rawls, NC
Mel Bell, SC
Spud Woodward, GA
Erica Burgess, FL

Other Commissioners/Proxies

Chris Batsavage, NC
David Borden, RI
Peter Clarke, NJ
Tom Fote, NJ
Emerson Hasbrouck, NY (GA)
Doug Haymans, GA
Bill Hyatt, CT
Raymond Kane, MA
Kathy Knowlton, GA

Dee Lupton, NC
John Maniscalco, NY
Chris McDonough, SC
Conor McManus, RI
Eric Reid, RI
Malcolm Rhodes, SC
Dan Ryan, DC
Ritchie White, NH
Renee Zobel, NH

Staff

Bob Beal
Laura Leach
Toni Kerns
Pat Campfield

Tina Berger
Geoff White

Guests

Karen Abrams, NMFS
Max Appelman, NOAA
Pat Augustine, Coram, NY
Alan Bianchi, NC DENR
Jeff Brust, NJ DEP
Diane Bynum
Lyndie Hice-Dunton, ROSA

Sheila Eyler, USFWS
Cynthia Ferrio, NOAA
James Fletcher
Marty Gary, PRFC
Amelia Herrington, Univ ME
Heidi Henninger, Offshore Lobster
Helen Takade-Heumacher, US FWS

Jesse Hornstein, NYS DEC
Brian Kelly
Ben Levitan, Earth Justice
Tom Lilly
Chip Lynch, NOAA
Samantha MacQuesten, NJ DEP
Meredith Mendelson, ME DMR
Steve Meyers
Chris Moore, CBF
Brandon Muffley, MAFMC
Allison Murphy, NOAA
Trish Murphey, NC DENR
Thomas Newman

Virginia Olsen, Lobster Local 207
Will Poston, SGA
Jill Ramsey, VMRC
Jason Rock, NC DENR
Mike Ruccio, NOAA
Amy Schueller, NOAA
Somers Smott, VMRC
John Sweka, US FWS
Meredith Whitten, NC DENR
Angel Willey, MD DNR
Chris Wright, NOAA
Faith Zerbe, DE Riverkeeper
Jordan Zimmerman, DE DFW

CALL TO ORDER

The Executive Committee (EC) of the Atlantic States Marine Fisheries Commission convened August 3, 2022 in the Jefferson Ballroom at The Westin Crystal City. The meeting was called to order at 8:02 a.m. by Chair Spud Woodward.

APPROVAL OF AGENDA

The agenda was approved, with the addition of a report from the Awards Committee.

APPROVAL OF PROCEEDINGS

The summary minutes from the May 4, 2022 meeting were approved as presented.

PUBLIC COMMENT

There was no public comment.

CARES ACT UPDATE

Mr. Beal presented an update on the CARES Act. The first round of CARES funding is almost fully disbursed, except for \$1,000,000 which will be spent by the end of 2022. There remains about \$20,000,000 in CAA which is on track to be fully spent by June 2023. If there are funds that will not be able to be disbursed, the Executive Committee will consider reallocating these funds to states who have remaining needs. The EC agreed to discuss potential reallocation options at the Annual Meeting in November

DE MINIMIS WORK GROUP

Ms. Kerns presented a report of the *De Minimis* Work Group (WG). The WG developed a white paper which outlines recommendations for setting *de minimis* standards within Commission FMPs. The recommendations propose to allow species Boards to deviate from the standards to address unique characteristics of a fishery. It is noted, Federal FMPs do not recognize *de minimis* standards; therefore, any *de minimis* measure implemented in a Commission FMP for jointly

managed species could result in inconsistent measures between state and federal waters. After a thorough discussion, the EC approved the white paper for review and action by the Policy Board.

INVESTMENT POLICY

Mr. Beal presented the Commission's updated Investment Policy, which has two tiers, an Operating account and a Reserve Fund, instead of three tiers in the original Policy. Upon a motion by Ms. Patterson and a second by Mr. Keliher, the motion to approve the revised Investment Policy was unanimously approved.

RESILIENT COASTS AND ESTUARIES ACT

A summary of the Resilient Coasts and Estuaries Act (H.R. 7801) was presented to the EC. The EC recommended the ISFMP Policy Board agree to support this pending legislation and send a letter to the leadership of the House Natural Resources Committee conveying the Commissions support. The Policy Board agree with the EC recommendation.

RESPONSIBLE OFFSHORE SCIENCE ALLIANCE

Ms. Hice-Dunton provided an overview of the Responsible Offshore Science Alliance (ROSA), and requested the states consider providing financial support to the efforts of ROSA. The States will continue to independently discuss potential financial support for ROSA.

APPEALS PROCESS

Mr. Beal presented the further draft revisions to the appeals process. The updated process better defined the range of options available for corrective action, provides the opportunity for the Policy Board to request additional technical information, and recognizes the potential interactions with the Councils on jointly managed plans. The updated

appeals process was recommended to the Policy Board for consideration and approval. Mr. Clark moved acceptance of the proposed changes to be forwarded to the Policy Board for action. Ms. Patterson seconded the motion and it passed unanimously.

OTHER BUSINESS

Mr. Gilmore brought forward a recommendation from the Awards Committee. The Committee received a nomination for a state employee who had done an amazing job managing the CARES and CAA funding. Upon discussing this nomination, the Committee realized there were staff in each state who had also done an amazing job and recommended that one person from each state be recognized at the upcoming Commission Annual Meeting. This recommendation was approved by the EC and remanded back to the Awards Committee for action.

ADJOURN

The Executive Committee adjourned at 10:00 a.m.

Atlantic States Marine Fisheries Commission

Business Session

November 9, 2022, 10:15 – 11:15 a.m.

November 10, 2022, 2:15 – 2:30 p.m.

Hybrid Meeting

Draft Agenda

The times listed are approximate; the order in which these items will be taken is subject to change; other items may be added as necessary.

November 9

1. Welcome/Call to Order (*S. Woodward*) 10:15 a.m.
2. Board Consent 10:15 a.m.
 - Approval of Agenda
 - Approval of Proceedings from May 2022
3. Public Comment 10:20 a.m.
4. Consider Approval of 2023 Action Plan (*S. Woodward*) **Final Action** 10:25 a.m.
5. Elect Chair and Vice-Chair (*R. Beal*) **Final Action** 11:00 a.m.

November 10

6. Review Noncompliance Findings, if necessary **Final Action** 2:15 p.m.
7. Other Business/Adjourn 2:30 p.m.

The meeting will be held at The Ocean Place Resort (1 Ocean Boulevard, Long Branch, NJ; 732.571.4000) and via webinar; click [here](#) for details

Draft Proceedings of the Business Session
May 2022

**DRAFT PROCEEDINGS OF THE
ATLANTIC STATES MARINE FISHERIES COMMISSION
BUSINESS SESSION**

**The Westin Crystal City
Arlington, Virginia**

May 4, 2022

These minutes are draft and subject to approval.
The Business Session will review the minutes during its next meeting.

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Call to Order, Chair A. G. "Spud" Woodward 1

Consider Approval of Atlantic Striped Bass Amendment 7 1

Adjournment 1

These minutes are draft and subject to approval.
The Business Session will review the minutes during its next meeting.

INDEX OF MOTIONS

1. **On behalf of the Atlantic Striped Bass Management Board, move the Commission to approve Amendment 7 to the Interstate Fishery Management Plan for Atlantic Striped Bass as amended by the Board (Page 1).** Motion by Marty Gary. Motion carried (Page 1).
2. **Move to adjourn** by Consent (Page 1).

ATTENDANCE

Board Members

Megan Ware, ME, proxy for P. Keliher (AA)	Roy Miller, DE (GA)
Steve Train, ME (GA)	Craig Pugh, DE, proxy for Rep. Carson (LA)
Sen. David Miramant, ME (LA)	Mike Luisi, MD, Administrative proxy
Cheri Patterson, NH (AA)	Dave Sikorski, MD, proxy for Del. Stein (LA)
Dennis Abbott, NH, proxy for Sen. Watters (LA)	Pat Geer, VA, Administrative proxy
Dan McKiernan, MA (AA)	Shanna Madsen, VA, proxy for Sen. Mason (LA)
Raymond Kane, MA (GA)	Chris Batsavage, NC, proxy for K. Rawls (AA)
Jason McNamee, RI (AA)	Jerry Mannen, NC (GA)
David Borden, RI (GA)	Bill Gorham, NC, proxy for Rep. Steinberg (LA)
Eric Reid, RI, proxy for Sen. Sosnowski (LA)	Mel Bell, SC (AA)
Matt Gates, CT, proxy for Justin Davis, CT (AA)	Chris McDonough, SC, proxy for Sen. Cromer (LA)
Jim Gilmore, NY (AA)	Doug Haymans, GA (AA)
Joe Cimino, NJ (AA)	Spud Woodward, GA (GA)
Tom Fote, NJ (GA)	Hannah Hart, FL, proxy for J. McCawley (AA)
Kris Kuhn, PA, proxy for T. Schaeffer (AA)	Marty Gary, PRFC
Loren Lustig, PA (GA)	Karen Abrams, NMFS
John Clark, DE (AA)	

(AA = Administrative Appointee; GA = Governor Appointee; LA = Legislative Appointee)

Staff

Robert Beal	James Boyle	Jeff Kipp
Toni Kerns	Pat Campfield	Sarah Murray
Tina Berger	Emilie Franke	Caitlin Starks
Maya Drzewicki	Lisa Havel	Deke Tompkins
Kristen Anstead	Chris Jacobs	

Guests

Debra Abercrombie, US FWS	Michelle Duval, MAFMC	Kathy Knowlton, VMRC
John Almeida, NOAA	Lynn Fegley, MD DNR	Wilson Laney
Max Appelman, NOAA	Cynthia Ferrio, NOAA	Meghan Lapp, Seafreeze Ltd
Pat Augustine, Coram, NY	Dawn Franco, GA DNR	Tom Lilly
Linda Barry, NJ DEP	Alexa Galvan, VMRC	Chip Lynch, NOAA
Julia Beaty, MAFMC	Lewis Gillingham, VMRC	Kim McKown, NYS DEC
Rick Bellavance, Kingstown, RI	Angela Giuliano, MD DNR	Nichola Meserve, MA DMF
Alan Bianchi, NC DENR	Jay Hermsen, NOAA	Steve Meyers
Colleen Bouffard, CT DEEP	Helen Takade Heumacher	Mike Millard
Jeff Brust, NJ DEP	Jesse Hornstein, NYS DEC	Henry Milliken, NOAA
Laura Cimo, NOAA	Robert Jeter	Brandon Muffley, MAFMC
Heather Corbett, NJ DEP	Ellen Keane, NOAA	Thomas Newman
Kiley Dancey, MAFMC	Emily Keiley, NOAA	Adam Nowalsky, NJ
Maureen Davidson, NYS DEC	Adam Kenyon, VMRC	Derek Orner, NOAA

These minutes are draft and subject to approval.
The Business Session will review the minutes during its next meeting.

Guests (continued)

Jainita Patel, VIMS
Michael Pierdinock
Nicholas Popoff, US FWS
Will Poston, SGA
Jill Ramsey, VMRC

Kathy Rawls, NC (AA)
Jason Rock, NC DENR
Tara Scott, NOAA
Alexei Sharov, MD DNR
Somers Smott, VMRC

Carrie Upite, NOAA
Craig Weedon, MD DNR
Chris Wright, NOAA
Renee Zobel, NH FGD

The Business Session of the Atlantic States Marine Fisheries Commission convened in the Jefferson Ballroom of the Westin Crystal City Hotel, Arlington, Virginia, a hybrid meeting, in-person and webinar; Thursday, May 5, 2022, and was called to order at 11:00 a.m. by A.G. “Spud” Woodward.

CALL TO ORDER

CHAIR A. G. “Spud” Woodward: We do have one, one I guess somewhat important piece of business that I don’t need to overlook, and that is a Business Session to approve Amendment 7. With that I will turn it over to Marty.

CONSIDER APPROVAL OF ATLANTIC STRIPED BASS AMENDMENT 7

MR. MARTIN GARY: Thank you, Mr. Chairman. I would be honored to read into the record the following outcome from yesterday’s Atlantic Striped Bass Management Board meeting. **On behalf of the Atlantic Striped Bass Management Board, move the Commission to approve Amendment 7 to the Striped Bass Interstate Fishery Management Plan as amended by the Board.**

CHAIR WOODWARD: Thank you, Marty. This is a Board motion so it doesn’t need a second. Is there any discussion on this motion? **All right, seeing none; is there any opposition to this motion? Seeing none; are there any abstentions, any null votes? Seeing none; the motion is unanimously approved.** All right.

ADJOURNMENT

(Whereupon the meeting adjourned at
11:02 a.m. on Thursday, May 5, 2022)

Atlantic States Marine Fisheries Commission

Coastal Sharks Management Board

*November 9, 2022
11:30 a.m. – 12:00 p.m.
Hybrid Meeting*

Draft Agenda

The times listed are approximate; the order in which these items will be taken is subject to change; other items may be added as necessary.

- | | |
|---|------------|
| 1. Welcome/Call to Order (<i>M. Bell</i>) | 11:30 a.m. |
| 2. Board Consent | 11:30 a.m. |
| • Approval of Agenda | |
| • Approval of Proceedings from May 2022 | |
| 3. Public Comment | 11:35 a.m. |
| 4. Set 2023 Specifications (<i>D. Colson Leaning</i>) Final Action | 11:40 a.m. |
| 5. Consider Fishery Management Plan Review and State Compliance of the 2020 Fishing Year (<i>D. Colson Leaning</i>) Action | 11:50 a.m. |
| 6. Other Business/Adjourn | 12:00 p.m. |

The meeting will be held at The Ocean Place Resort (1 Ocean Boulevard Long Branch, NJ; 732.571.4000) and via webinar; click [here](#) for details

MEETING OVERVIEW

Coastal Sharks Management Board

Wednesday, November 9, 2022

11:30 – 12:00 p.m.

Webinar

Chair: Mel Bell (NC) Assumed Chairmanship: 05/21	Technical Committee Chair: Angel Willey (MD)	Law Enforcement Committee Representative: Greg Garner (SC)
Vice Chair: Erika Burgess (FL)	Advisory Panel Chair: Vacant	Previous Board Meeting: May 4, 2022
Voting Members: MA, RI, CT, NY, NJ, DE, MD, VA, NC, SC, GA, FL, NMFS (13 votes)		

2. Board Consent

- Approval of Agenda
- Approval of Proceedings from May 2022

3. Public Comment – At the beginning of the meeting public comment will be taken on items not on the agenda. Individuals that wish to speak at this time must sign-in at the beginning of the meeting. For agenda items that have already gone out for public hearing and/or have had a public comment period that has closed, the Board Chair may determine that additional public comment will not provide additional information. In this circumstance the Chair will not allow additional public comment on an issue. For agenda items that the public has not had a chance to provide input, the Board Chair may allow limited opportunity for comment. The Board Chair has the discretion to limit the number of speakers and/or the length of each comment.

4. Set 2022 Specifications (11:40-11:50 a.m.) Final Action

Background

- NOAA Fisheries published proposed 2023 Coastal Sharks Specifications in September. The proposed rule includes a season start date of January 1 and quotas for the Atlantic Region and No Regional Quota Management Groups for 2023 are unchanged from 2022 levels.
- The fishing season will start with a commercial retention limit of 55 for Large Coastal Sharks other than sandbar sharks per vessel per trip. The retention limit of Blacknose sharks will start at 8 sharks per vessel trip.

Presentations

- NOAA Fisheries Proposed Rule for 2023 Specification by D. Colson Leaning

Board actions for consideration at this meeting

- Set the 2023 coastal shark specifications including commercial opening dates and commercial possession limit by management group.

5. Consider Fishery Management Plan Review and State Compliance of the 2020 Fishing Year (11:50 a.m.-12:00 p.m.) Action

Background

- State Compliance Reports are due annually on August 1st.
- The Plan Review Team reviewed each state report and compiled the annual FMP Review for the 2020 fishing year.
- Massachusetts has requested *de minimis* status and the TC recommends that *de minimis* status be granted.

Presentations

- Overview of the FMP Review Report by D. Colson Leaning (**Briefing Materials**)

Board actions for consideration at this meeting

- Accept 2020 FMP Review and State Compliance Report.
- Approve *de minimis* requests from Massachusetts.

6. Other Business/Adjourn

Coastal Sharks

Activity level: Low

Committee Overlap Score: low (some overlap with Sciaenids Board species)

Committee Task List

- TC – August 1st: Annual compliance reports due

TC Members: Angel Willey (MD, Chair), Bryan Frazier (SC), Donna McDowell (GA), Brent Winner (FL), Greg Skomal (MA), Chris Scott (NY), David Behringer (NC), Conor McManus (RI), Greg Hinks (NJ), Joshua McGilly (VA), Matt Gates (CT), Tobey Curtis (NOAA), Michael Frisk (NY), Scott Newlin (DE), Julie Neer (SAFMC), Dustin Colson Leaning (ASMFC)

**DRAFT PROCEEDINGS OF THE
ATLANTIC STATES MARINE FISHERIES COMMISSION
COASTAL SHARKS MANAGEMENT BOARD**

**The Westin Crystal City
Arlington, Virginia
May 4, 2022**

These minutes are draft and subject to approval by the Coastal Sharks Management Board.
The Board will review the minutes during its next meeting.

Draft Proceedings of the Coastal Sharks Management Board Webinar
May 2022

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Adjournment	15

These minutes are draft and subject to approval by the Coastal Sharks Management Board.
The Board will review the minutes during its next meeting

INDEX OF MOTIONS

1. **Approval of Agenda** by consent (Page 1).
2. **Approval of Proceedings of October 20, 2021** by consent (Page 1).
3. **Move to set the retention limit to zero (close the commercial and recreational fisheries) for shortfin mako upon implementation of the NOAA final rule** (Page 7). Motion by Mike Luisi; second by John Clark. Motion carried with 1 null vote (Page 9).
4. **Move to nominate Thomas Newman (NC) to the Coastal Sharks Advisory Panel** (Page 15). Motion by Chris Batsavage; second by Pat Geer. Motion carried (Page 15).
5. **Motion to adjourn** by consent (Page 15).

Draft Proceedings of the Coastal Sharks Management Board Webinar
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ATTENDANCE

Board Members

Dan McKiernan, MA (AA)	Craig Pugh, DE, proxy for Rep. Carson (LA)
Raymond Kane, MA (GA)	Mike Luisi, MD, Administrative proxy
Sarah Ferrara, MA, proxy for Rep. Peake (LA)	Robert Brown, Sr., MD, proxy for R. Dize (GA)
Jason McNamee, RI (AA)	Lewis Gillingham, VA, Administrative proxy
Eric Reid, RI, proxy for Sen. Sosnowski (LA)	Shanna Madsen, VA, proxy for Sen. Mason (LA)
Matt Gates, CT, proxy for J. Davis (AA)	Chris Batsavage, NC, proxy for K. Rawls (AA)
Bill Hyatt, CT (GA)	Jerry Mannen, NC (GA)
Jim Gilmore, NY (AA)	Bill Gorham, NC, proxy for Rep. Steinberg (LA)
Scott Curatolo-Wagemann, NY, proxy for E. Hasbrouck (GA)	Mel Bell, SC (AA)
Joe Cimino, NJ (AA)	Chris McDonough, SC, proxy for Sen. Cromer (LA)
Tom Fote, NJ (GA)	Doug Haymans, GA (AA)
John Clark, DE (AA)	Spud Woodward, GA (GA)
Roy Miller, DE (GA)	Hannah Hart, FL, proxy for J. McCawley (AA)
	Karyl Brewster-Geisz, NMFS

(AA = Administrative Appointee; GA = Governor Appointee; LA = Legislative Appointee)

Staff

Bob Beal	Emilie Franke	Sarah Murray
Toni Kerns	Lisa Havel	Julie Simpson
Tina Berger	Chris Jacobs	Deke Tompkins
Kristen Anstead	Jeff Kipp	Geoff White
Maya Drzewicki	Dustin Colson Leaning	

Guests

Debra Abercrombie, US FWS	Deborah Hahn, US FWS	Leonard Rudow, <i>Fish Talk Mag</i>
Jordan Andrews, <i>Press Herald</i>	Brenden Harrison, NJ DEP	Sean Breit-Rupe, Thompson McMullan
Max Appelman, NOAA	Greg Hinks, NJ DEP	Chris Scott, NYS DEC
Pat Augustine, Coram, NY	Carol Hoffman, NYS DEC	Somers Smott, VMRC
Alan Bianchi, NC DENR	Jesse Hornstein, NYS DEC	Carrie Soltanoff, NOAA
Karen Bradbury, Ofc. Sen. Whitehouse	Jeff Kaelin, Lund's Fisheries	Drew Sommo
Bill Brantley, NC DENR	Carl LoBue, TNC	Craig Weedon, MD DNR
Jeff Brust, NJ DEP	Paul Marzolla	John Whiteside
Laura Cimo, NOAA	John Maniscalco, NYS DEC	John Page Williams, CBF
Maureen Davidson, NYS DEC	Kim McKown, NYS DEC	Ann Williamson, NOAA
Guy DuBeck, NOAA	Steve Meyers	Steve Witthuhn
Dawn Franco, GA DNR	Rob O'Connor, NYS DEC	Chris Wright, NOAA
Pat Geer, VMRC	Derek Orner, NOAA	Renee Zobel, NH FGD
Bob Giordano	Michael Pierdinock	
	Jill Ramsey, VMRC	

These minutes are draft and subject to approval by the Coastal Sharks Management Board.
The Board will review the minutes during its next meeting.

The Coastal Sharks Management Board of the Atlantic States Marine Fisheries Commission convened in the Jefferson Ballroom of the Westin Crystal City Hotel, Arlington, Virginia, a hybrid meeting, in-person and webinar; Wednesday, May 4, 2022, and was called to order at 10:15 a.m. by Chair Robert E. Beal.

CALL TO ORDER

CHAIR ROBERT E. BEAL: I would like to call to order the meeting of the Coastal Sharks Management Board. My name is Bob Beal; I am once again the stand-in Chair for this meeting. Mel Bell unfortunately is not able to be here, as I mentioned yesterday during the menhaden meeting. But Mel is online, if he has any comments we'll acknowledge him, for sure.

Erika Burgess from Florida is the Vice-Chair of this Board, and she's not here today. Hannah Hart is her proxy. Since neither the Chair nor the Vice-Chair are here, I will be chairing this meeting.

APPROVAL OF AGENDA

CHAIR BEAL: With that we'll jump right into it. Everyone has been provided an agenda in the supplemental materials that were sent around, and are on the Commission's website.

Are there any additions or changes to the agenda that is provided in the supplemental material? Seeing no hands, we'll have that agenda approved by consent.

APPROVAL OF PROCEEDINGS

CHAIR BEAL: Essentially the same question for the proceedings from October of 2021. It's been a little while since this management board has gotten together. But the proceedings were on the briefing materials.

Any changes or adjustments to the proceedings of any sort? All right, seeing none, the proceedings from October of 2021 stand approved.

PUBLIC COMMENT

CHAIR BEAL: That brings us to public comment. Is there any public comment on items that are not included on the agenda? A pretty small crowd in the back of the room, and no hands are up.

No public comment that I can see. If needed, we'll provide the opportunity to have public comment later in the meeting.

CONSIDERATION OF ZERO RETENTION OR CLOSURE OF THE SHORTFIN MAKO FISHERY

CHAIR BEAL: With that I think we'll jump into Agenda Item Number 4, which is the Consideration of Zero Retention or Closure of the Shortfin Mako Fishery, and Karyl Brewster-Geisz from NOAA Fisheries is here, and she's going to give a presentation on the background of that. Whenever you're ready to go, Karyl, it's all yours. Thank you, glad to see you.

OVERVIEW OF THE NOAA FISHERIES PROPOSED RULE

MS. KARYL BREWSTER-GEISZ: Thanks, Bob, it's great to be here and to see everybody, and hello to everybody online. I'm here today to talk about our Proposed Rule on Shortfin Mako Sharks. I'll give you a little bit of the background and why we're doing this, and the request for public comments. Usually when I come, our rules have already closed public comment, but in this case, we are still open, so I'm looking forward to whatever comments all of you have. This proposed rule is a reaction to ICCATs, the International Commission for the Conservation of Atlantic Tuna recommendation on shortfin mako that came out of the November, 2021 meeting. If you remember, ICCAT recommendations are binding, they are not voluntary, so we are required to implement their recommendation, and that's what we are doing through this proposed rule. Our current regulations are not quite restrictive as the current ICCAT recommendation.

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A little bit of a reminder about what ICCAT has done over the past few years regarding shortfin mako. In 2017 ICCAT assessed shortfin mako, and found that they were overfished and experiencing overfishing, and that significant reductions are needed in mortality, in order to even begin rebuilding the stock.

In 2019 they updated that 2017 assessment, and found that even more reductions were needed than thought, and recommended that ICCAT adopt a non-retention policy to accelerate the rates of recovery. In 2019 ICCAT also adopted Recommendation 19-06 to maintain the measures in 17-08. That was that 2017 recommendation, and called for additional measures to establish the rebuilding plan. That is what ICCAT looked at in 2021.

ICCAT Recommendation 21-09 prohibits the retention of shortfin mako in 2022 and 2023. It looked at whether or not there could be an allowance for limited retention after 2023, if fishing mortality across all nations is reduced below 250 metric tons. Fishing mortality is all landings all dead discards, all fisheries.

SCRS will be looking to confirm how to calculate that 250 metric tons at its upcoming meetings. ICCAT recommendation 21-09 also included additional measures such as minimum standards for handling and release of shortfin makos, improving data and scientific research on mating, nursing grounds, and also looking at whether or not the minimum sizes we have in effect now are effective at reducing mortality.

I'm now going to remind you, all of you, what we did, we being the United States in response to the previous ICCAT recommendations. In 2018, after the 2017 stock assessment, we took emergency action where we prohibited the retention of any live shortfin mako on commercial vessels, and we also established a recreational minimum size of 83 inches.

In 2019 we proposed and finalized Amendment 11, and that changed things a little bit. That did continue the commercial measures of no live retention. Pelagic longline vessels need to have electronic monitoring or videos to confirm that they are not retaining any live shortfin mako. Then recreationally we separated the minimum size into 71 inches fork length for males, and 83 inches fork length for females.

We also expanded the circle hook requirement. If you all remember, it was when we had Amendment 11 proposed that this body considered and then adopted Addendum V that allows for this body to make quick changes to minimum sizes and retention limits. Previously, before the 2017 stock assessment, U.S. catch across the entire Atlantic Basin represented approximately 14 percent of the total catch.

By 2020, as a result of the measures in Amendment 11, we reduced that percentage to 3 percent, and our U.S. catch and fishing mortality was reduced 90 percent from our 2013 to 2017 average. In other words, we did a really great job reducing our shortfin mako mortality. Unfortunately, that was not enough, and ICCAT now has a new recommendation, as I said 21-09, no retention for 2022 and 2023. We are proposing an alternative that would provide a flexible mako shark retention limit, with a default limit of 0 across the commercial and the recreational fisheries.

After 2023, if ICCAT determines that some retention is allowed, we could increase that retention limit. The retention limit would apply to all HMS permit holders, recreational and commercial, and all the existing prohibitions on other commercial gears would remain. During the fishing year we could increase that retention limit, once ICCAT tells us that we have that ability, or we could subsequently decrease it.

It all depends upon how catch rates are going. We are not setting an upper limit; we aren't setting what that retention limit would be above 0. It could be moving to 1 fish per person. If there is enough

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retention, it could be 1 per person per year. It really depends upon how much mortality ICCAT tells us we are allowed.

Research of shortfin mako sharks would continue. Whether or not we allow researchers to retain dead shortfin makos would be done on a case-by-case basis, similarly to how we handle dusky sharks. Our preference is nonlethal sampling only. We did look at two other alternatives, one was keeping our no action or status quo measures from Amendment 11.

We determined that that was not consistent with ICCAT Recommendation 21-09. We also looked at whether or not we should prohibit shortfin mako sharks entirely, and decided that also was not consistent with the ICCAT recommendations, because the ICCAT recommendation does allow for retention at some point in the future. We are in the middle of the comment period, it closes next week on May 11th. We intend to publish the final rule in June.

That is when the entry into force date comes into effect from ICCAT, ICCAT is going to be holding additional meetings to test and determine the appropriateness of the additional measures in Recommendation 21-09. That brings me to the end, I am happy to answer any questions anyone has. If you have questions after the meeting, feel free to reach out to Carrie Soltanoff or Guy DuBeck of my staff, and you can always make comments at the web page as noted.

CHAIR BEAL: Great, thank you, Karyl for the presentation, and are there questions on the ICCAT decision or NOAAs proposed rule in response to that? John Clark and then Mike Luisi.

MR. JOHN CLARK: Thank you for the presentation, Karyl. I'm just curious, if the U.S. is only 3 percent of the take of mako sharks now, where is most of the catch coming from,

and are those countries going to enforce this retention ban?

MS. BREWSTER-GEISZ: The negotiations at ICCAT were quite fierce last November, where you had a number of countries, such as Canada, that have already banned the retention of shortfin makos, and then countries such as the U.S. and the EU that still allow for retention. It was negotiations between all of these countries and Japan that led us to the prohibition of retention. There are a lot of countries in ICCAT. I would just say that the EU had a number of those landings, just like the U.S. did, and the countries within the EU and Japan.

MR. CLARK: Do you anticipate that enforcement will be good in the EU?

MS. BREWSTER-GEISZ: That is the hope. ICCAT does have its Compliance Committee that looks at whether or not countries are following the recommendations.

CHAIR BEAL: Mike Luisi, go ahead please.

MR. MICHAEL LUISI: Thanks for the presentation, Karyl. I had the opportunity, gosh, probably four, five years ago now, to spend a couple weeks at an ICCAT meeting, and I've never seen anything like it in my life. It was mind blowing. I guess my questioning is kind of along the lines of John's.

You know I feel like when the recommendation comes out of ICCAT, the United States takes serious and swift action. But I got the sense during the discussions that we were having at that meeting that there really isn't anybody being held to the fire, I guess. I mean there is a Compliance Committee, I understand that.

But it just is concerning that as John mentioned. You know we are a small fraction of the mortality, and we take these measures. It's responsible to take the measures. I just hope that in your work with ICCAT that we can really try to come up with a way to hold people accountable, hold other countries accountable for what those

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recommendations are. That is my comment, thank you.

CHAIR BEAL: I have Jim Gilmore, then Jason McNamee, then Tom Fote.

MR. JAMES J. GILMORE: Thanks, Karyl, that's a great presentation. The Rule and even for ICCAT, is essentially a retention rule. Is there anything in there about targeting, or is it just simply retention?

MS. BREWSTER-GEISZ: Because there is no retention allowed, it doesn't really get into targeting. Although it does make it very clear that even once retention is allowed, it will be retention only of dead shortfin makos, that there will be no retention of live shortfin makos. The measures implemented in the recommendation also strengthen a lot of those data reporting requirements. Hopefully that will address some of the compliance issues that we've had.

CHAIR BEAL: Jim, you're all set, all right, Jason McNamee.

DR. JASON McNAMEE: Thank you for the presentation. My question is on the, so it's being reevaluated. It seems like a short amount of time. I'm wondering if there is going to be enough information to make sort of a judgment in 2023 that is different, or can we assume that, and I'm supportive of this by the way, but just wondering if we can sort of assume that this will persist probably past 2023.

MS. BREWSTER-GEISZ: I will tentatively say yes that I expect that it is unlikely all the countries will arrive at a point where all mortality from any catches is below 250 metric tons as soon as 2024. There is going to be another stock assessment, I want to say in 2024. We will have more information at that point. But as Europe has committed to looking at all the data that's coming in, and also trying to determine if the minimum sizes that we have currently in place

would be effective, or if there are other measures effective in reducing mortality of makos once they're caught.

CHAIR BEAL: Thanks, Karyl, and Tom Fote, then I'll go to Doug Haymans.

MR. THOMAS P. FOTE: I was a little confused what you said, Karyl, because I understood you said both the recreational and the commercial, they reduced, they allow us to have a bycatch. But the recreational always lands live, so that means they will never be allowed to have a bycatch like in the commercial. I've got a second question after that if you want to answer that one first.

MS. BREWSTER-GEISZ: I'll answer that one first. Yes, the recommendation currently is dead only once retention is allowed. But ICCAT will be looking at those minimum sizes, and if they find that the minimum sizes are effective, then there is that possibility for live retention.

MR. FOTE: Okay, my second question is, what are the landings? Does ICCAT have any estimate of what the landings are by the nonmember countries that are not members of ICCAT, what their landings of shortfins are?

MS. BREWSTER-GEISZ: I do not have the answer to that one, I will get back to you. My thought is that most of the countries that are involved in ICCAT are the ones landing. There aren't that many.

MR. FOTE: I think of a couple, maybe it's changed over the last couple years, there were a lot of countries that were landing all kinds of things, and they weren't members, and they were actually landings in those countries, because they could away with not landing in ICCAT country. I don't know if there is any way of recording those numbers, and what the actual loss is. I'm sorry, I wasn't speaking into the microphone, did everybody hear me? Okay, thank you.

CHAIR BEAL: Tom, you all set, Karyl, you're all set? Mr. Haymans, please.

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MR. DOUG HAYMANS: Karyl, I'm not speaking for everybody, but I certainly I'm just going to echo the fact that it's very disappointing that we just made regulations in the process we go through in the states, and now we have this. But more so, because this is controlled through the HMS permit, at least on the recreational side.

Is there really anything that some of our states need to do? I mean if we've already got in place the Amendment 11, or whatever it was, the 83-inch limit, right. Because you said there is obviously a difference between the prohibited and retention, right. Do I really need to do anything if HMS permit is going to control it?

MS. BREWSTER-GEISZ: Thank you for that question. The answer is yes. There are a number of states that do not require HMS permits in order to go fishing for sharks in state waters. While it is rare that such a state water fisherman fishing in state waters would catch a shortfin mako, it is not impossible for one to land a shortfin mako, and that would have repercussions for the United States.

MR. HAYMANS: Short follow up. What are those repercussions?

MS. BREWSTER-GEISZ: United States would be found out of compliance with ICCAT, which would mean possibly trade restriction for U.S. fish, or additional measures against us.

CHAIR BEAL: Hannah, do you have your hand up? Hannah Hart, please.

MS. HANNAH HART: Yes, I guess just a follow up to that. Is this something that we could consider *de minimis* for on a species level, given that, you know landings in state waters, especially recreationally are probably very few and far between? I don't know that we can disperse that MRIP data out, but just curious if that could be something we could consider.

MS. BREWSTER-GEISZ: ICCAT doesn't have a *de minimis* standing.

CHAIR BEAL: Any other hands around the table in the room? I've got one online, Lewis Gillingham, go ahead, please.

MR. LEWIS GILLINGHAM: Thank you, Karyl for the presentation this morning. I think inadvertently you've answered my initial question, which was that 250 metric ton threshold is for all 50 odd countries involved, not just the U.S. Then I would just remind, when we did this back in 2019, the major concern was exactly what's being expressed now, that are the other countries going to follow suit, where with these size limits we've almost essentially shut down the recreational fishery. I think people are afraid to keep a mako period, because they don't want to handle those bigger fish, plus they're not sure they can identify the males from females, I think it's almost gone to zero, so that has been very effective. That's all, thank you.

CHAIR BEAL: Other comments or questions? I've got a couple hands online. Bill Gorham, go ahead please, Bill.

MR. BILL GORHAM: Is there currently any countries that are out of compliance, or have been warned that they will be out of compliance in reference to this fishery? It seems like there is some resistance from other countries to follow suit with a drastic reduction, while the United States leads with only 3 percent, and a 90 percent reduction from when first asked. When you talk to fishermen, you kind of like to hear the light at the end of the tunnel, and it doesn't appear to be possible without the action of other countries.

MS. BREWSTER-GEISZ: At this point there are no countries that have been found out of compliance with recommendation 19-06 for ICCAT, which does allow for some retention of mako.

CHAIR BEAL: All right, that's all the hands I see around the room and online, so what is the pleasure of the Board? Is there a motion to take

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like action as a Proposed Rule from NOAA or anything else? Oh, Dan, you had your hand up before. I'm sorry.

MR. DANIEL MCKIERNAN: I guess I'm looking for guidance. I guess it's been identified that a recreational permit holder in state waters isn't subject to the federal HMS requirements, and so is it the expectation of NOAA that we would ban the harvest, and then write a caveat within the rule that federally permitted vessels, which we do for a lot of other fisheries.

Federally permitted vessels are allowed to bring product in, subject to federal rules. Is that the end point? I'm going to have to go back home. Then my second question is, what would be the timing for which we would enact this rule to satisfy the folks at NOAA and ICCAT?

CHAIR BEAL: Karyl, can you reply to that?

MS. BREWSTER-GEISZ: Yes. It would be wonderful if this body could enact measures that are consistent with what we're proposing. It is a binding recommendation, so at minimum we do need to prohibit retention this year and next year. That could be done through doing something like what we're proposing.

Changing the retention limit to zero, and providing some flexibility, which I believe Addendum V provides, or it could be that this body decides it's easier to just prohibit the retention of shortfin mako in state waters. There are lots of ways to go about doing it, but it would be really good if this body could be consistent with the recommendation.

CHAIR BEAL: You all set, Dan? Great, thanks. Yes, Tom, one more shot at it then Mike Luisi, did you have your hand up?

MR. FOTE: Yes, I just wanted to clear up what Dan said. I don't think that if you have an HMS permit, that even if you're fishing in state waters. It was like every other federal permit.

If you have the federal permit you have to basically do the example of what's the most stringent regulation. If you have an HMS you can't fish in state waters. Is that correct?

MS. BREWSTER-GEISZ: That is correct, yes. If you have an HMS permit you have to abide by the more restrictive regulation, whether it's federal or state, because there are states that are more restrictive than us.

MR. FOTE: Because that really just affects people that are bycatching a mako while they're fishing for striped bass or something else in state waters, because if you're really targeting some sharks, no matter where you are you really have to have a federal permit.

CHAIR BEAL: Mike Luisi, go ahead, please.

MR. LUISI: Based on your request and the recommendation from Karyl, I think in the past we've tried to maintain consistency with the federal rulemaking process. I'm not prepared to go back home and start making changes now, but I think based on the final rule and the action that NOAA Fisheries takes on this, that it would be in the best interest of this Board to maintain that consistency. I'm happy to make a motion.

CHAIR BEAL: Mike, let me interrupt you. The staff has drafted a motion here, but it's essentially immediate. You know states would implement a zero retention or close their fisheries for shortfin mako right now. If you want to modify that to say upon publication of the final rule at NOAA, we would have to put that in there.

It depends on what the will of the group is, and what you want to do as the maker of the motion. If you want to close it now or wait until the final rule. We just need to put the final rule language in here, if that is what you want to do. The final rule should be out in June, right, Karyl? Yes, she's shaking her head, yes.

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MR. LUISI: Yes, I think for the purposes of what we have to do at the state level, it would make more sense for me, personally, to implement that measure after the final rule. It will be an easier process. **I would move to set the retention limit to zero for shortfin mako, close the commercial and recreational fisheries for shortfin mako upon implementation of the NOAA final rule.**

CHAIR BEAL: Is there a second to that? John Clark, thank you. Discussion on this motion. A number of states around the table have their regulations linked to the federal regulations. Once the federal regulations go in place they automatically change. Maybe the timing, linking it to the final NOAA rule would make more consistency across our states. That might work. Other comments. I saw a couple hands, Chris Batsavage. Well, Mike, you're the maker of the motion. I'll go back to you, then Chris.

MR. LUISI: Yes, I'm not trying to complicate things. I hope it would be easier for the states around the table to implement those measures based on the final rule. But if not, I certainly welcome any comments on that.

CHAIR BEAL: We'll see where this takes us. Chris Batsavage.

MR. CHRIS BATSAVAGE: Yes, I can support the motion. I supported being consistent with the federal measures anyways. This gets to the point that not every state's administrative process is the same, and some states take a little longer than others. We could probably have this implemented in North Carolina right around the time the final rule comes out.

But I think it's important to have the consistent measures, just to close any potential loopholes that could occur with not having the same things in place in state waters, even though it might be unlikely to have makos in state waters. All you need is somebody to tell an enforcement officer that it caught it in state

waters, and they have a hard time defending that in court. That's why I'm supporting this.

CHAIR BEAL: Dan McKiernan, please.

MR. MCKIERNAN: Yes, I can support the measure, I just want there to be realistic expectations that each of us is going to have a unique rulemaking timeline, and so by virtue of getting the summary motions from this meeting, I'll be able to serve that upstairs, and I'm sure we can get it close to the adoption of the federal rule, but it may not be on the same timeframe.

CHAIR BEAL: That's fair, and I think a lot of states will be in that same situation. The administrative timelines to get these in place will vary, but the process will be started by this motion. Other comments. Yes, Chris.

MR. CHRIS WRIGHT: I would just like to repeat the having the specific language for the implementation of a NOAA rule is going to help. You know we have a fairly extended process for rule implementation, so our stuff ties to federal regulations, so this makes it a whole lot easier for us.

CHAIR BEAL: Great. I had Hannah.

MS. HART: Yes, I guess just a clarification question on timelines. We would still have some time after June to get this put in place. It's not like it has to be in place by June.

CHAIR BEAL: Yes, I think the idea is as soon as possible, given your administrative process after the publication of the final NOAA rule would be the goal. I know that's a little bit of a soft goal, but I think it's the best we can do with a short timeline and that sort of thing. But everybody's working in the same direction. Pat Geer.

MR. PAT GEER: Virginia is in favor of this. We will probably be able to do this in July at our meeting, so it will probably be effective August 1, so we're saying we'll be okay with that.

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CHAIR BEAL: Thanks, Pat, also from Virginia I've got Lewis Gillingham online. His hand is up. Lewis, do you have something to add beyond Pat's comment?

MR. GILLINGHAM: Well, that is essentially what I was going to say as well. But I know Toni passed a poll to get an idea when states could implement that, and I didn't see that in any of the meeting materials, including the supplemental. Would this be a good time to take a look at that? I would like to know the results of that. But I know we support the idea of it, it's just the timing, the compliance time. Thank you.

CHAIR BEAL: Yes, Lewis, thanks for that suggestion. I think we've got a whole other agenda item and only about a half an hour to go in this meeting. Rather than go state by state through that poll, we can share that information with the states after this meeting. But I think the idea is pretty clear on the record from folks in the room that administrative processes vary up and down the coast. But everybody will try to do the best they can, and move as quickly as they can within their process, if that's okay.

Mel Bell, you had your hand up earlier, but I assume Chris McDonough made the same comment you would have made, is that correct? We can't hear you, Mel, but Chris verified you're all set, so we're good. Any other comments on this motion? All right, I'm going to take a gamble here. Is there any opposition to the motion that's on the board from folks around the table? I should have asked for caucuses, but it seemed like everyone was on pretty close to the same page here. **I don't see any hands for a caucus or any opposition to this motion. Are there any abstentions to the motion? Seeing no hands, the motion passes by consent.** We are all set. Yes, Mr. Haymans, go ahead.

MR. HAYMANS: There is a null down here from Georgia.

CHAIR BEAL: Georgia is a null vote, all right, n-u-l-l, sorry. Thank you, we will get that in the record. Georgia is a null vote. Excellent, so anything else on shortfin mako? Karyl, are you all set?

MS. BREWSTER-GEISZ: Yes, thank you very much.

CHAIR BEAL: Great, thank you. All right, we're going to go on to the next agenda item, which is talking about CITES and a number of sharks that are being proposed to be added to Appendix II. There are 54 species there for listed, and 50 lookalikes, and Dustin can take us through that and give us the background on the issue. It's all you, Dustin, go ahead.

MR. DUSTIN COLSON LEANING: In the interest of time and striped bass today, I'll try to move through this quickly. The Commission was recently made aware of the fact that Panama has proposed a listing of four IUCN listed shark species to CITES Appendix II. The Ganges and the smalltail shark are assessed as critically endangered globally, and the dusky and the grey reef shark are assessed as endangered globally.

The proposal asserts that the regulation of trade in these species is necessary to avoid them from becoming eligible for inclusion in Appendix I in the near future. I'll get into what each of the appendices mean in a little bit. The proposal also includes the remaining members of the Carcharhinidae family, which includes 50 species.

The justification is provided that the fins and meat of these four species are very difficult to differentiate from the other 50 species in the family, many of which are already classified under IUCN as endangered as well. The proposal elaborates that customs enforcement capacity varies by country, and visual inspection is often the only tool available at their disposal for some countries.

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To ensure none of the four proposed species slipped through undetected, they proposed all 50 lookalike species be included in Appendix II, which identification experts and educators say can be visually differentiated from other species that would not fall under CITES Appendix I and II listing. As a reminder, CITES Appendix II listing still allows for the international trade of that species, so long as the exporter is granted an export permit or a re-export certificate.

Permits or certificates are only to be granted if the relevant authorities are satisfied that certain conditions are met. Above all, that trade will not be detrimental to the survival of the species in the wild. Often CITES Appendix II listed species are not necessarily threatened with immediate extinction, but increased trade may bring them into that category, which would fall under Appendix I, a species that is threatened with extinction. Of the 54 proposed species, 12 of the species are currently managed by the Commission, and they are listed up here on the screen, by group as well. Blue, Bull, Blacktip, Lemon, Finetooth, Atlantic Sharpnose and Blacknose sharks are all currently quota managed species managed by the Commission within the Coastal Sharks FMP. Smalltail, Dusky, Caribbean Reef, Bignose and Galapagos sharks are prohibited species within the Commission's FMP. For your reference I've also provided stock status by species. Blue sharks, Atlantic Blacktip sharks, Atlantic Sharpnose, and Finetooth sharks are assessed to be not overfished, nor was overfishing occurring during the last assessment.

Blacknose and Dusky sharks are overfished and experiencing overfishing, as of the latest stock assessment, and the remaining six species, their stock statuses are just unknown at this point. I'll close with a quick snapshot of commercial landings in pounds for the seven species that are quota managed.

The fisheries for Blue, Bull, Lemon, Finetooth and Blacknose sharks have been quite small in

the five of the most recent years for which we have data for. Blacktip and Atlantic Sharpnose shark harvest is between the 100,000 and 300,000 pound range from year to year. Now that you've been briefed on this issue, the question for the Board's consideration is, if the Commission should comment on this proposal, to add 54 shark species to CITES Appendix II.

Deb Hahn from the Association of Fish and Wildlife Agencies originally brought this to ASMFCs and to state agencies attention, to see if the Commission would like to provide comment on the draft proposal, and they are looking for comment in a relatively fast turnaround, hopefully by the end of next week.

If it is the will of the Board here to have the Commission provide comment, that would be a tasking to the Policy Board to consider this issue again tomorrow. We do have a draft motion prepared, but it might be helpful for the Board to discuss some justification, or some of the content that they would like to be included in a letter, if such a letter is desired to be written.

CHAIR BEAL: Great, thanks, Dustin. Let's start with questions or comments on Dustin's presentation, and you know the CITES process is something ASMFC kind of dabbles in it from time to time. Process-wise I get it's not super familiar to all of us, but the question is, do we want to send a letter commenting on this, and if we do, what do you want the letter to say? Are we in favor or in opposition? If we're in opposition, why? What justification do we want to provide in that? With that, questions and comments. John Clark.

MR. CLARK: Yes, I just had a question, Bob. How much of the shark landed here is exported or would have some of these limits put on it?

MR. COLSON LEANING: It's a good question. I wish I was prepared for that question. I would have to get back to you on that.

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MR. CLARK: If I can just follow up. I mean this is what would be covered, right? It's banned to the export of this shark, so if none of it is being exported it's not really a problem here.

MR. COLSON LEANING: Yes, that's correct. It would only be additional paperwork for exports. I definitely can get back to you on that, and I'm also wondering. I'm not sure if Karyl, with more experience working with coastal sharks, might have an idea. Sorry to put you on the spot, Karyl. If you don't have an answer that's completely fine.

CHAIR BEAL: Karyl, before you answer really quick: John, this doesn't ban the exports, it just creates a whole boatload of associated paperwork.

MR. CLARK: No, I get that, Bob. If it's one of those things where we're not doing this anyhow, I don't have any problem with joining CITES on it.

CHAIR BEAL: Fair enough. Karyl, do you have any numbers on exporting or product that stays domestic?

MS. BREWSTER-GEISZ: I am opening up our SAFE Report to find out the numbers. It is not just additional paperwork for the dealers, it's actually a lot of paperwork for the dealers. If I remember correctly, there are only certain ports that they can import and export product from, so this includes any product from the high seas, then good through the EEZ, which I think for most of the coastal sharks probably is not an issue. But let me get back to you. I'm opening the SAFE Report now, I'll get back to you in a minute.

CHAIR BEAL: Great, thanks, other questions while Karyl is picking through her files? I've got two hands online, Roy Miller, go ahead, please.

MR. ROY W. MILLER: A quick question. Since this proposal includes members of the family

Carcharhinidae, the obvious question is some other families are currently not included, such as the hammerhead family, Sphyrnidae, the Tiger shark family. Are we going to see more of this in the future, or are they going to include the other shark species that might already be in the fin trade, such as the hammerhead?

MR. COLSON LEANING: Great question, Roy. There has been a proposed rule that has gone through the federal register of other shark species that have been proposed as well. U.S. Fish and Wildlife tends to categorize the listing of species in three different levels. Level A being most likely that U.S. Fish and Wildlife is going to put forward as a recommendation for Appendix II listing or Appendix I listing. No shark species made it into Row A, or Category A.

There were however, six species of hammerhead sharks that could potentially. The U.S. Fish and Wildlife is undecided at this time. They could forward a recommendation. None of those six, to my understanding, are within the species that the Commission manages. But in Category C, I think environmental NGOs have pretty much proposed all sharks be listed. But U.S. Fish and Wildlife Service has indicated that they are unlikely to forward that as a recommendation, unless there is greater amounts of data or support for those listings.

CHAIR BEAL: You know Roy, I guess to add to what Dustin said. I think the international concern and interest in shark fin trade and other things. Probably the short answer to your question is yes. More of these things are going to be proposed in the near future would be my guess. Mel Bell.

MR. MEL BELL: Yes, John kind of hit on it. I don't really have a clear picture on, and that's what Karyl is looking for, I guess, on how much actually gets exported. I know it's not something we track at the state level. We basically just deal with the initial wholesale dealers. But I was wondering, and Karyl mentioned that there was significant, I guess paperwork associated with this for the dealers. But is there also a requirement for the states to

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basically be involved in permitting oversight or something? Beyond just the dealers, could the states get kind of dragged into the administrative process of this?

CHAIR BEAL: I think Karyl is going to help us with this, and she may have also opened the SAFE Report and can help with John Clark's question from earlier.

MS. BREWSTER-GEISZ: I will try to answer all the questions that have come up. In terms of shark exports. The U.S. doesn't export a lot. We do not have data by species. U.S. Census data does shark fins, shark fresh, shark frozen. In 2010, for example, we had 36 metric tons of fin exports. Now it's down to 3 metric tons in 2020.

Fresh exports were 222 metric tons of shark exports, and in 2020 it was 427, so that one went up. Frozen exports went from 244 in 2010 to 109 in 2020. Also keep in mind this is not just the Atlantic, this is the entire U.S. exports. There is not a lot, compared to some of our species, but it does seem to be increasing on the fresh exports.

There was a question about hammerhead sharks. Hammerhead sharks, great, smooth and scalloped are already listed on Appendix II. The proposal that has come forward is to list all the rest of the hammerhead species, and that includes for our purposes bonnethead sharks. Whether or not they should be listed, and the whole purpose there is fin look alike. All of this is people saying that the fins of the sharks look alike, and it's too difficult for enforcement to monitor them. In terms of the paperwork. I don't know specifically if the states would be involved.

I think they would be. Fish and Wildlife Service is the one who issues all the permits. They do reach out to us when they get applications for us to check our data. I am assuming, though I don't know for sure, that they would also reach

out to the states to see if there is state data that would be applicable to making their decision on whether to issue the permit.

CHAIR BEAL: Great, thanks, Karyl, that's helpful on the import/export for sure. Dan McKiernan.

MR. McKIERNAN: Yes, just a point of clarification, Bob. I've been copied on two letters from Massachusetts Industry interests about possible listing of spiny dogfish and Winter Skate. Is this a separate issue that we're going to discuss either under Other Business, or by the Policy Board?

CHAIR BEAL: Yes. The idea was to see where this goes specific to these 54 species, recommendation to the Policy Board. During the Policy Board we were going to bring up spiny dogfish, as you recommended. American eel is back being proposed to be listed in Appendix II, again, we've commented on that multiple times. We're going to tackle both of those tomorrow during Policy Board.

MR. McKIERNAN: All right, thanks.

CHAIR BEAL: Any other comments on what to do with this later? I do have Deborah Hahn from Association of Fish and Wildlife Agency. She's kind of the CITES expert, so she might be able to help us out. I'm going to go to Deb, and hear her comment, and hopefully she can clarify some of these questions. Deb, are you available?

MS. DEBORAH HAHN: Yes, thanks, Bob. I was talking with Toni earlier this week and catching up in e-mails with Dustin, so I thought I would join in today just in case. Yes, so you've got a couple different things going on here. You've got a proposal from the country of Panama for the species that you just heard about, and then you have a federal register notice process, where the Fish and Wildlife Service goes out to the public and says, let's use considered listing, delisting, up listing, whatever it is within the CITES appendices.

That is where these other species of sharks and rays will come in in your discussions tomorrow. Because

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they are in the undecided category within the federal register notice. If you do have any concerns, I'm not as familiar with shark's export. But it sounds like there is not a lot. But if there are concerns, it would be great to share those, just so that data and that information is in the public record, and Fish and Wildlife Service can take that into account when they make their decisions.

It is likely with sharks, I mean I kind of feel like we're destined to have them all listed eventually, and that's kind of the example of the Panama proposal, where you have a whole suite of sharks, and then a whole other 40 or more that are listed for lookalike issues. Again, as you guys noted, Appendix II did not ban international trade. It does add a burden to folks who are applying to new species internationally.

From a state perspective, it just sort of depends. Some of our states that export a lot of Appendix II species or support that export, like in Bobcat have to do tagging, have to do reporting every five years. For these sharks it should not be that burdensome. You may get a question from Fish and Wildlife every now and again about an export, and information on your laws and regulations.

One of the things they do is one, they make sure it was legally taken within the state regulations, and then also they may ask for data over time to try to determine whether the case is sustainable. That is where the voting can come in, but I don't believe it would be a lot, and I don't believe it would be regular communication on that.

AS for American eel, it is in the unlikely category within the federal register notice. It would be great just to have some public record comments from all of you on that just so they are there. But it is highly unlikely that there will be anything moving forward on American eel

this year. I'll stop there and answer the comments.

CHAIR BEAL: Great, thanks, Deb, for the comments. Very helpful, and we'll see if there are questions directed at you. I've got one more member at the table, then I've got one member of the public with his hand up. I'll go to the table, Spud Woodward, and then we'll go to the member of the public.

MR. A.G. "SPUD" WOODWARD: Question for Karyl. Where are we in terms of harvesting along the Atlantic coast, sharks pursuant to the quotas? Are we hitting the quotas? Are we chronically under harvesting? What is the general trend?

MS. BREWSTER-GEISZ: We are so far below the quota of all of these species.

MR. WOODWARD: I guess this is my comment on this is, in the South Atlantic, and I assume this is going to become a problem farther north is, shark depredation is an increasingly annoying problem. It's leading to increasing fishing mortality; you know when fish have to be discarded and then replaced by a whole fish that can be legally landed.

My question is, is this going to further disincentivize commercial harvest, and lead to further depression of domestic landings? A lot of folks, right or wrong, perceive that one of the solutions to shark depredation is to max out the allowable removals, you know whether it be recreational, but primarily commercial. I guess my question is, is this going to be a disincentive that may continue to dampen down domestic landings?

CHAIR BEAL: Is that rhetorical, Spud, or are you directing it at someone?

MR. WOODWARD: No, I would like somebody to give me at least a perspective on it, because just as a lay person that's not involved, the more complicated you make things, sometimes that's just another disincentive for people to do it. I'm just curious if it's enough of a disincentive that it will affect people's willingness to stay in the shark

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fishery, to be active in the shark fishery, that kind of thing.

CHAIR BEAL: Karyl, you took your mask off like you are willing to respond. I don't know if you want to respond. Do you have a response to that?

MS. BREWSTER-GEISZ: I can tell you what we've been hearing. We recently released our shark fishery review. It is a draft document; we're still working on the final. What we found is that the commercial shark fishery overall is not doing well. Number of permits are decreasing. The trend in the retention of sharks meeting the quotas is going down. The number of active permit holders is going down.

A lot of this happened after hammerhead sharks were listed. Dealers have reported difficulty getting the permits or even having the context in which to make the sales if they happen to get a Fish and Wildlife permit to export hammerhead sharks. In short, what I am hearing is the fishermen and dealers are telling us that yes, at least listing hammerheads and silky sharks and the other sharks that have recently been listed as Appendix II has been a disincentive for people to come into the fishery.

CHAIR BEAL: Thanks, Karyl. As I said, I have one hand in the public, then we can come back and talk about whether we should send a letter or not. With that, John Whiteside, just pretty quickly. We're starting to run a little bit late on time here, so if you could make your comment quickly that would be great.

MR. JOHN WHITESIDE: Yes, good morning. This is regarding spiny dogfish and Winter Skate. It's tied into what you're saying, so I'm not sure whether I should comment now or you want me to wait on that. I'll hold if you want.

CHAIR BEAL: Yes, let's wait on that until tomorrow's Policy Board meeting if you're okay with that, John.

MR. WHITESIDE: I am, as long as that's also going to be the last comments that would be taken before a decision on sending a letter or not, because that is what this is all about.

CHAIR BEAL: Well, the decision on the shark letter that we're talking about now is an independent decision from the spiny dogfish letter, so it will be two different suggestions.

MR. WHITESIDE: Okay, thank you very much.

CHAIR BEAL: With that, you know as I mentioned, we've commented on eels, this isn't an Eel Board meeting, but we have commented on eels as a Commission that said, we don't support listing in Appendix II, because ASMFC and the states have a very stringent management program, very restrictive quotas, very effective management.

The import and export are highly controlled on America eels, especially elvers, export of elvers is highly controlled through a few control points, et cetera, et cetera. Does this group want to say something similar to that about sharks? In other words, very conservative management program in the United States, effective shark finning enforcement and monitoring and that sort of thing, if folks feel that way?

Is that kind of the idea that folks want to put into a letter, or the other way, which is does this Board support the listing in Appendix II. It is really up to the group, but I just wanted to give everyone perspective on what this group has said, what the Commission has said about American eel in the past.

With that, any thoughts or comments on where we go from here? I sense not a strong feeling around the room. Anyone, just general direction. A letter to highlight the concerns that the Commission has, or letter to highlight support that the Commission has? Any direction at all would be great. Tom.

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MR. FOTE: I just have great difficulty that we're putting things on lists just because they can't basically enforce what the laws are doing. Sooner or later we'll basically be putting a lot more sharks and everything else on these lists. Over the years I've been here a long time, I notice we never go back the other way. I'm still struggling with the bluefin tuna allocation that was made 30 years ago on the recreational sector. I have a problem. I would support the letter, because I just think it's so much paperwork and everything else involved that we don't need at this time. I'll leave it at that.
CHAIR BEAL: Mel Bell, you have a comment?

MR. BELL: Yes, you know we expressed a number of concerns in all of this. I just felt like maybe it would be good to at least get those on paper, because I guess we're laterallying this to the Policy Board for tomorrow. I'm not sure exactly what to say, but if somehow, we could capture some of our concerns at least, have them on a record. I would be in favor of saying something. But I guess we don't have to decide that right now, that would go to the Policy Board tomorrow.

CHAIR BEAL: Yes, that would be correct, we'll go to Policy Board tomorrow, Mel. Rick, please, go ahead.

MR. RICK BELLEVANCE: I don't have a specific position on this, but I have served in a previous role as Co-Chair of the International Relations Committee for the Association of Fish and Wildlife Agencies, have worked closely with Deb Hahn for the last several years. Just to give some context.

Frequently the states have chosen to weigh in on these issues in the context of acknowledging the vital role that sustainable use plays in conserving our natural resources, and that that ought to be taken into consideration on these listing decisions. As a result, this body might choose to follow that sort of lead of expressing

the importance of sustainable use in advancing the conservation of shark species.

CHAIR BEAL: Thanks, Rick, appreciate that comment. Others around the table. You know the other option is individual states can comment on their own, and the Commission doesn't have to comment, if there is a difference of opinion around the table. Go ahead Dan, please.

MR. MCKIERNAN: I would be in favor of the Commission writing a letter on behalf of the member states.

CHAIR BEAL: Dan, that letter would express concern with listing these 54 species in Appendix II?

MR. MCKIERNAN: Yes.

CHAIR BELL: Great. We at staff will try to come up with a couple bullets to capture this conversation, and maybe reference some of the previous letters that we've sent on similar things, and get those maybe up on a slide for the Policy Board tomorrow, if that works for everybody. We'll go the other way. Is there any opposition to forwarding that to the Policy Board as a recommendation? All right, we'll do that.

**REVIEW AND POPULATE THE COASTAL SHARKS
ADVISORY PANEL**

CHAIR BELL: We have one more agenda item on an Advisory Panel nomination. Tina, are you available for that?

MS. TINA L. BERGER: I am, thank you. I offer for the Board's consideration the nomination of Thomas Newman, an inshore gillnetter from North Carolina. Thomas replaces Dewey Hemilright, who served on the AP for many years, and we appreciate Dewey's contributions to the management program. I offer this for your consideration and approval.

CHAIR BEAL: Thank you, Tina, is there a nomination. Chris Batsavage.

MR. BATSAVAGE: I move to nominate Thomas Newman to the Coastal Sharks Advisory Panel from North Carolina.

CHAIR BEAL: Seconded by Pat Geer. Any opposition to this addition to the Coastal Shark Advisory Panel? **All right, seeing none; Thomas Newman is the newest member of the AP.**

ADJOURNMENT

CHAIR BEAL: Any other topics or other business to come before the Coastal Shark Management Board today? All right, seeing none we stand adjourned, and we'll start, I guess we have a little meeting of Striped Bass this afternoon. We'll start that at 11:30.

(Whereupon the meeting adjourned at 11:15
a.m. on Wednesday, May 4, 2022)

could retain an amount of red porgy over the longest amount of time during the fishing seasons and would increase the likelihood of red porgy remaining open to commercial harvest and available to consumers for as long as possible. Additionally, the proposed trip limit is expected to minimize discards of incidentally harvested red porgy when targeting other snapper-grouper species such as gray triggerfish and vermilion snapper.

Recreational Bag and Possession Limits

The current recreational bag and possession limits for red porgy in the South Atlantic, established by Amendment 13C to the FMP, are 3 per person per day, or 3 per person per trip, whichever is more restrictive. Amendment 50 would reduce the recreational bag and possession limits to 1 fish per person per day, or 1 fish per person per trip, whichever is more restrictive.

Given the substantial reduction in harvest needed to end the overfishing of red porgy and increase the likelihood of rebuilding the stock, the Council selected the lowest bag limit that was considered in Amendment 50 to continue to allow recreational retention and to help constrain harvest to the reduced recreational ACL.

Recreational Fishing Season

The recreational harvest of red porgy is currently allowed year-round until the recreational ACL is met or is projected to be met. Amendment 50 would establish a recreational fishing season for red porgy where harvest would be allowed May 1 through June 30. The recreational sector would be closed annually from January 1 through April 30, and July 1 through December 31. During the proposed seasonal closures, the recreational bag and possession limits for red porgy would be zero.

Given the substantial reductions in harvest that are needed to address the stock's overfishing and overfished determinations, shortening the time recreational fishing is allowed contributes to reducing the risk that recreational catches exceed the proposed reduced ACL. The Council selected the most conservative recreational fishing season alternative in Amendment 50 to reduce the chance the recreational ACL would be exceeded, while still allowing some recreational harvest opportunities to occur.

Recreational AMs

The current recreational AMs were established through Amendment 34 to the FMP (81 FR 3731, January 22, 2016).

The AM includes an in-season closure for the remainder of the fishing year if recreational landings reach or are projected to reach the recreational ACL, regardless of whether the stock is overfished. The AM also includes post-season adjustments. If recreational landings exceed the recreational ACL, then during the following fishing year recreational landings will be monitored for a persistence in increased landings. If the total ACL is exceeded and red porgy are overfished, the length of the recreational fishing season and the recreational ACL are reduced by the amount of the recreational ACL overage.

Amendment 50 would revise the recreational AMs for red porgy. The current in-season closure and the post-season AM would be removed. The proposed recreational AM would be a post-season AM that would be triggered in the following fishing year if the recreational ACL is exceeded. If recreational landings exceed the recreational ACL, the length of the following year's recreational fishing season would be reduced by the amount necessary to prevent the recreational ACL from being exceeded in the following year. However, the length of the recreational season would not be reduced if the Regional Administrator determines, using the best scientific information available, that a reduction is not necessary.

The Council's intent in revising the recreational AMs is to avoid in-season closures of the recreational sector and extend maximum fishing opportunities to the sector during the proposed 2-month recreational season. The proposed AM would remove the current potential duplicate AM application of a reduction in the recreational season length and a payback of the recreational ACL overage if the total ACL was exceeded. Under this proposed measure, the AM trigger would not be tied to the total ACL, but only to the recreational ACL. The proposed modification would ensure that overages in the recreational sector do not in turn affect the catch levels for the commercial sector. Any reduced recreational season length as a result of the AM being implemented would apply to the recreational fishing season following a recreational ACL overage.

Proposed Rule for Amendment 50

A proposed rule to implement Amendment 50 has been drafted. In accordance with the Magnuson-Stevens Act, NMFS is evaluating the proposed rule for Amendment 50 to determine whether it is consistent with the FMP, the Magnuson-Stevens Act, and other applicable law. If that determination is

affirmative, NMFS will publish the proposed rule in the **Federal Register** for public review and comment.

Consideration of Public Comments

The Council has submitted Amendment 50 for Secretarial review, approval, and implementation. Comments on Amendment 50 must be received by November 8, 2022. Comments received during the respective comment periods, whether specifically directed to Amendment 50 or the proposed rule, will be considered by NMFS in the decision to approve, partially approve, or disapprove, Amendment 50. All comments received by NMFS on the amendment or the proposed rule during their respective comment periods will be addressed in the final rule.

Authority: 16 U.S.C. 1801 *et seq.*

Dated: September 6, 2022.

Kelly Denit,

Director, Office of Sustainable Fisheries, National Marine Fisheries Service.

[FR Doc. 2022-19508 Filed 9-8-22; 8:45 am]

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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 635

[Docket No. 220902-0184; RTID 0648-XC082]

Atlantic Highly Migratory Species; 2023 Atlantic Shark Commercial Fishing Year

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Proposed rule; request for comments.

SUMMARY: This proposed rule would adjust quotas and retention limits and establish the opening date for the 2023 fishing year for the Atlantic commercial shark fisheries. Quotas would be adjusted as required or allowable based on any underharvests from the 2022 fishing year. NMFS proposes the opening date and commercial retention limits to provide, to the extent practicable, fishing opportunities for commercial shark fishermen in all regions and areas. The proposed measures could affect fishing opportunities for commercial shark fishermen in the northwestern Atlantic Ocean, Gulf of Mexico, and Caribbean Sea.

DATES: Written comments must be received by October 11, 2022.

ADDRESSES: You may submit comments on this document, identified by NOAA–NMFS–2022–0064, by electronic submission. Submit all electronic public comments via the Federal e-Rulemaking Portal. Go to <https://www.regulations.gov> and enter NOAA–NMFS–2022–0064 in the search box. Click on the “Comment” icon, complete the required fields, and enter or attach your comments.

Instructions: Comments sent by any other method, to any other address or individual, or received after the end of the comment period, may not be considered by NMFS. All comments received are a part of the public record and will generally be posted for public viewing on www.regulations.gov without change. All personal identifying information (e.g., name, address, etc.), confidential business information, or otherwise sensitive information submitted voluntarily by the sender will be publicly accessible. NMFS will accept anonymous comments (enter “N/A” in the required fields if you wish to remain anonymous).

Copies of this proposed rule and supporting documents are available from the Atlantic Highly Migratory Species (HMS) Management Division website at <https://www.fisheries.noaa.gov/topic/atlantic-highly-migratory-species> or by contacting Ann Williamson (ann.williamson@noaa.gov) by phone at 301–427–8503.

FOR FURTHER INFORMATION CONTACT: Ann Williamson (ann.williamson@noaa.gov), Guy DuBeck (guy.dubeck@noaa.gov), or Karyl Brewster-Geisz (karyl.brewster-geisz@noaa.gov) at 301–427–8503.

SUPPLEMENTARY INFORMATION:

Background

Atlantic shark fisheries are managed primarily under the authority of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act; 16 U.S.C. 1801 *et seq.*) and the Atlantic Tunas Convention Act (16 U.S.C. 971 *et seq.*). The 2006 Consolidated Atlantic HMS Fishery Management Plan (2006 Consolidated HMS FMP) and its amendments are implemented by regulations at 50 CFR part 635.

For the Atlantic commercial shark fisheries, the 2006 Consolidated HMS FMP and its amendments established

default commercial shark retention limits, commercial quotas for species and management groups, and accountability measures for underharvests and overharvests. The retention limits, commercial quotas, and accountability measures can be found at 50 CFR 635.24(a), 635.27(b), and 635.28(b). Regulations also include provisions allowing flexible opening dates for the fishing year (§ 635.27(b)(3)) and inseason adjustments to shark trip limits (§ 635.24(a)(8)), which provide management flexibility in furtherance of equitable fishing opportunities, to the extent practicable, for commercial shark fishermen in all regions and areas. In addition, § 635.28(b)(4) lists species and management groups with quotas that are linked. If quotas are linked, when the specified quota threshold for one management group or species is reached and that management group or species is closed, the linked management group or species closes at the same time (§ 635.28(b)(3)). Lastly, pursuant to § 635.27(b)(2), any annual or inseason adjustments to the base annual commercial overall, regional, or sub-regional quotas will be published in the **Federal Register**.

2023 Proposed Commercial Shark Quotas

NMFS proposes to adjust the quota levels for the various shark stocks and management groups for the 2023 Atlantic commercial shark fishing year (i.e., January 1 through December 31, 2023) based on underharvests that occurred during the 2022 fishing year, consistent with existing regulations at § 635.27(b). Overharvests and underharvests are accounted for in the same region, sub-region, or fishery in which they occurred the following year, except that large overharvests may be spread over a number of subsequent fishing years up to a maximum of five years. If a sub-regional quota is overharvested, but the overall regional quota is not, no subsequent adjustment is required. Unharvested quota may be added to the quota for the next fishing year, but only for shark management groups that have shark stocks that are declared not overfished and not experiencing overfishing. No more than 50 percent of a base annual quota may be carried over from a previous fishing year.

Based on 2022 harvests to date, and after considering catch rates and landings from previous years, NMFS

proposes to adjust the 2023 quotas for certain management groups as shown in Table 1. All of the 2023 proposed quotas for the respective stocks and management groups will be subject to further adjustment in the final rule after NMFS considers landings submitted in the dealer reports through mid-October. NMFS anticipates that dealer reports received after that time will be used to adjust 2024 quotas, as appropriate, noting that, in some circumstances, NMFS re-adjusts quotas during the subject year.

Because the Gulf of Mexico blacktip shark management group and smoothhound shark management groups in the Gulf of Mexico and Atlantic regions are not overfished, and overfishing is not occurring, available underharvest (up to 50 percent of the base annual quota) from the 2022 fishing year for these management groups may be added to their respective 2023 base quotas. NMFS proposes to account for any underharvest of Gulf of Mexico blacktip sharks by dividing underharvest between the eastern and western Gulf of Mexico sub-regional quotas based on the sub-regional quota split percentage (§ 635.27(b)(1)(ii)(C)).

For the sandbar shark, aggregated large coastal shark (LCS), hammerhead shark, non-blacknose small coastal shark (SCS), blacknose shark, blue shark, porbeagle shark, and pelagic shark (other than porbeagle or blue sharks) management groups, the 2022 underharvests cannot be carried over to the 2023 fishing year because those stocks or management groups are overfished, are experiencing overfishing, or have an unknown status. There are no overharvests to account for in these management groups to date. Thus, NMFS proposes that quotas for these management groups be equal to the annual base quota without adjustment, although the ultimate decision will be based on current data at the time of the final rule.

The proposed 2023 quotas by species and management group are summarized in Table 1 and the description of the calculations for each stock and management group can be found below. All quotas and landings are in dressed weight (dw) metric tons (mt). Table 1 includes landings data as of July 15, 2022. Final quotas are subject to change based on landings as of mid-October 2022.

TABLE 1—2023 PROPOSED QUOTAS AND OPENING DATES FOR THE ATLANTIC SHARK MANAGEMENT GROUPS

Region or sub-region	Management group	2022 Annual quota (A)	Preliminary 2022 landings ¹ (B)	Adjustments ² (C)	2023 Base annual quota (D)	2023 Proposed annual quota (D + C)	Season opening date
Western Gulf of Mexico.	Blacktip Sharks ..	347.2 mt (765,392 lb)	210.9 mt (464,908 lb)	115.7 mt (225,131 lb)	231.5 mt (510,261 lb)	347.2 mt (765,392 lb)	January 1, 2023.
	Aggregate Large Coastal Sharks ³ .	72.0 mt (158,724 lb)	67.3 mt (148,371 lb)		72.0 mt (158,724 lb)	72.0 mt (158,724 lb)	
	Hammerhead Sharks ⁴ .	11.9 mt (26,301 lb)	<2.0 mt (<4,400 lb)		11.9 mt (26,301 lb)	11.9 mt (26,301 lb)	
Eastern Gulf of Mexico.	Blacktip Sharks ..	37.7 mt (83,158 lb)	1.5 mt (3,339 lb)	12.6 mt (27,719 lb)	25.1 mt (55,439 lb)	37.7 mt (83,158 lb)	
	Aggregate Large Coastal Sharks ³ .	85.5 mt (188,593 lb)	36.1 mt (79,506 lb)		85.5 mt (188,593 lb)	85.5 mt (188,593 lb)	
	Hammerhead Sharks ⁴ .	13.4 mt (29,421 lb)	3.4 mt (7,487 lb)		13.4 mt (29,421 lb)	13.4 mt (29,421 lb)	
Gulf of Mexico	Non-Blacknose Small Coastal Sharks.	112.6 mt (428,215 lb)	17.1 mt (37,639 lb)		112.6 mt (428,215 lb)	112.6 mt (428,215 lb)	
	Smoothhound Sharks.	504.6 mt (1,112,441 lb)	0.0 mt (0 lb)	168.2 mt (370,814 lb)	336.4 mt (741,627 lb)	504.6 mt (1,112,441 lb)	
Atlantic	Aggregate Large Coastal Sharks.	168.9 mt (372,552 lb)	48.0 mt (105,893 lb)		168.9 mt (372,552 lb)	168.9 mt (372,552 lb)	January 1, 2023.
	Hammerhead Sharks ⁴ .	27.1 mt (59,736 lb)	21.5 mt (47,294 lb)		27.1 mt (59,736 lb)	27.1 mt (59,736 lb)	
	Non-Blacknose Small Coastal Sharks.	264.1 mt (582,333 lb)	29.8 mt (65,727 lb)		264.1 mt (582,333 lb)	264.1 mt (582,333 lb)	
	Blacknose Sharks (South of 34° N lat. Only).	17.2 mt (3,973,902 lb)	2.8 mt (6,231 lb)		17.2 mt (3,973,902 lb)	17.2 mt (3,973,902 lb)	
No Regional Quotas.	Smoothhound Sharks.	1,802.6 mt (3,973,902 lb)	176.8 mt (389,804 lb)	600.9 mt (1,324,634 lb)	1,201.7 mt (2,649,268 lb)	1,802.6 mt (3,973,902 lb)	January 1, 2023.
	Non-Sandbar LCS Research.	50.0 mt (110,230 lb)	2.1 mt (4,650 lb)		50.0 mt (110,230 lb)	50.0 mt (110,230 lb)	
	Sandbar Shark Research.	90.7 mt (199,943 lb)	38.2 mt (84,161 lb)		90.7 mt (199,943 lb)	90.7 mt (199,943 lb)	
	Blue Sharks	273.0 mt (601,856 lb)	<1.0 mt (<2,200 lb)		273.0 mt (601,856 lb)	273.0 mt (601,856 lb)	
	Porbeagle Sharks.	1.7 mt (3,748 lb)	0.0 mt (0 lb)		1.7 mt (3,748 lb)	1.7 mt (3,748 lb)	
	Pelagic Sharks Other Than Porbeagle or Blue.	488.0 mt (1,075,856 lb)	20.6 mt (45,383 lb)		488.0 mt (1,075,856 lb)	488.0 mt (1,075,856 lb)	

¹ Landings are from January 1, 2022 through July 15, 2022 and are subject to change.

² Underharvest adjustments can only be applied to stocks or management groups that are declared not overfished and have no overfishing occurring. The underharvest adjustments cannot exceed 50 percent of the base quota.

³ NMFS transferred 11.3 mt dw of the aggregate LCS quota from the Gulf of Mexico eastern sub-region to the western sub-region on June 28, 2022 (87 FR 38676; June 29, 2022).

⁴ NMFS transferred 6.8 mt dw of the hammerhead quota from the western Gulf of Mexico sub-region to the Atlantic region on June 28, 2022 (87 FR 38676; June 29, 2022).

Shark Management Groups Where Underharvests Can Be Carried Over

The Gulf of Mexico blacktip shark management group (which is divided between eastern and western sub-regions) and smoothhound shark management groups in the Gulf of Mexico and Atlantic regions are not overfished, and overfishing is not occurring. Pursuant to § 635.27(b)(2)(ii), available underharvest (up to 50 percent of the base annual quota) from the 2022 fishing year for these management groups may be added to their respective 2023 base quotas. Reported landings for blacktip sharks and smoothhound sharks have not exceeded their 2022 quotas to date.

Blacktip Sharks: The 2023 proposed commercial quota for blacktip sharks in

the western Gulf of Mexico sub-region is 347.2 mt dw (765,392 lb dw) and in the eastern Gulf of Mexico sub-region is 37.7 mt dw (83,158 lb dw). As of July 15, 2022, preliminary reported landings for blacktip sharks in the Gulf of Mexico western sub-region were at 61 percent (210.9 mt dw) of their 2022 quota (347.2 mt dw), and in the eastern sub-region were at 4 percent (1.5 mt dw) of their 2022 quota (37.7 mt dw). Consistent with § 635.27(b)(1)(ii)(C), any underharvest would be divided between the two Gulf of Mexico sub-regions based on the percentages that are allocated to each sub-region (*i.e.*, 90.2 percent to the western sub-region and 9.8 percent to the eastern sub-region). As of July 15, 2022, the overall Gulf of Mexico blacktip shark management

group is underharvested by 172.5 mt dw (380,303 lb dw). The proposed 2023 adjusted base annual quota for blacktip sharks in the western Gulf of Mexico sub-region is 347.2 mt dw (231.5 mt dw annual base quota + 115.7 mt dw 2022 underharvest = 347.2 mt dw 2023 adjusted annual quota) and in the eastern Gulf of Mexico sub-region is 37.7 mt dw (25.1 mt dw annual base quota + 12.6 mt dw 2022 underharvest = 37.7 adjusted annual quota).

Smoothhound Sharks: The 2023 proposed commercial quota for smoothhound sharks in the Gulf of Mexico region is 504.6 mt dw (1,112,441 lb dw) and in the Atlantic region is 1,802.6 mt dw (3,973,902 lb dw). As of July 15, 2022, there have been no smoothhound shark landings in the Gulf

of Mexico region, and 10 percent (176.8 mt dw) of their 2022 quota (1,802.6 mt dw) has been landed in the Atlantic region. NMFS proposes to adjust the 2023 Gulf of Mexico and Atlantic smoothhound shark quotas for anticipated underharvests in 2022 to the full extent allowed. The proposed 2023 adjusted base annual quota for Gulf of Mexico smoothhound sharks is 504.6 mt dw (336.4 mt dw annual base quota + 168.2 mt dw 2022 underharvest = 504.6 mt dw 2023 adjusted annual quota) and for Atlantic smoothhound sharks is 1,802.6 mt dw (1,201.7 mt dw annual base quota + 600.9 mt dw 2022 underharvest = 1,802.6 mt dw 2023 adjusted annual quota).

Shark Management Groups Where Underharvests Cannot Be Carried Over

Consistent with the current regulations at § 635.27(b)(2)(ii), 2022 underharvests cannot be carried over to the 2023 fishing year for the following stocks or management groups because they are overfished, are experiencing overfishing, or have an unknown status: sandbar shark, aggregated LCS, hammerhead shark, non-blacknose SCS, blacknose shark, blue shark, porbeagle shark, and pelagic shark (other than porbeagle or blue sharks) management groups. For these stocks, the 2023 proposed commercial quotas reflect the codified annual base quotas, without adjustment for underharvest. At this time, no overharvests have occurred, which would require adjustment downward.

Aggregate LCS: The 2023 proposed commercial quota for aggregated LCS in the western Gulf of Mexico sub-region is 72.0 mt dw (158,724 lb dw) and in the eastern Gulf of Mexico sub-region is 85.5 mt dw (188,593 lb dw). The 2023 proposed commercial quota for aggregated LCS in the Atlantic region is 168.9 mt dw (372,552 lb dw). In a recent action, NMFS transferred 11.3 mt dw of aggregate LCS quota from the eastern Gulf of Mexico sub-region to the western Gulf of Mexico sub-region (87 FR 38676; June 29, 2022). That inseason quota transfer would not impact the proposed actions in this rulemaking. As of July 15, 2022, preliminary reported landings for aggregated LCS in the western Gulf of Mexico sub-region were 81 percent (67.3 mt dw) of their 2022 quota (72.0 mt dw), in the eastern Gulf of Mexico sub-region were 49 percent (36.1 mt dw) of their 2022 quota (85.5 mt dw), and in the Atlantic region were 28 percent (48.0 mt dw) of their 2022 quota (168.9 mt dw). Reported landings from both Gulf of Mexico sub-regions and the Atlantic region have not exceeded the 2022 overall aggregated

LCS quota to date. Given the unknown status of some species in the aggregated LCS complex, the aggregated LCS quota cannot be adjusted for any underharvests. Based on preliminary estimates and catch rates from previous years, NMFS proposes that the 2023 quotas for aggregated LCS in the western and eastern Gulf of Mexico sub-regions and the Atlantic region be equal to their annual base quotas without adjustment.

Hammerhead Sharks: The 2023 proposed commercial quotas for hammerhead sharks in the western Gulf of Mexico sub-region is 11.9 mt dw (26,301 lb dw) and eastern Gulf of Mexico sub-region is 13.4 mt dw (29,421 lb dw). The 2023 proposed commercial quota for hammerhead sharks in the Atlantic region is 27.1 mt dw (59,736 lb dw). In a recent action, NMFS transferred 6.8 mt dw of hammerhead shark quota from western Gulf of Mexico sub-region to the Atlantic region (87 FR 38676; June 29, 2022). That inseason quota transfer would not impact the proposed actions in this rulemaking. As of July 15, 2022, preliminary reported landings of hammerhead sharks in the western Gulf of Mexico sub-region were less than 40 percent (<2.0 mt dw) of their 2022 quota (11.9 mt dw), in the eastern Gulf of Mexico sub-region were at 25 percent (3.4 mt dw) of their 2022 quota (13.4 mt dw), and in the Atlantic region were at 63 percent (21.5 mt dw) of their 2022 quota (27.1 mt dw). Reported landings from the Gulf of Mexico sub-regions and the Atlantic region have not exceeded the 2022 overall hammerhead quota to date. Given the overfished status of the scalloped hammerhead shark, the hammerhead shark quota cannot be adjusted for any underharvests. Based on preliminary estimates and catch rates from previous years, NMFS proposes that the 2023 quotas for hammerhead sharks in the western and eastern Gulf of Mexico sub-regions and Atlantic region be equal to their annual base quotas without adjustment.

Blacknose Sharks: The 2023 proposed commercial quota for blacknose sharks in the Atlantic region is 17.2 mt dw (37,921 lb dw). This quota is available in the Atlantic region only for those vessels operating south of 34° N latitude. North of 34° N latitude, retention, landing, or sale of blacknose sharks is prohibited. As of July 15, 2022, preliminary reported landings of blacknose sharks in the Atlantic region were at 16 percent (2.8 mt dw) of their 2022 quota (17.2 mt dw). Given the overfished status of the blacknose shark, the blacknose shark quota cannot be adjusted for any underharvests. Based on preliminary estimates and catch rates

from previous years, NMFS proposes that the 2023 quota for blacknose sharks in the Atlantic region be equal to their annual base quota without adjustment.

Non-Blacknose SCS: The 2023 proposed commercial quota for non-blacknose SCS in the Gulf of Mexico region is 112.6 mt dw (428,215 lb dw) and in the Atlantic region is 264.1 mt dw (582,333 lb dw). As of July 15, 2022, preliminary reported landings of non-blacknose SCS in the Gulf of Mexico were at 15 percent (17.1 mt dw) of their 2022 quota (112.6 mt dw) and in the Atlantic region were at 11 percent (29.8 mt dw) of their 2022 quota (264.1 mt). Given the unknown status of bonnethead sharks within Atlantic and Gulf of Mexico non-blacknose SCS management groups, underharvests cannot be carried forward. Based on preliminary estimates and catch rates from previous years, NMFS proposes that the 2023 quotas for non-blacknose SCS in the Gulf of Mexico and Atlantic regions be equal to their annual base quotas without adjustment.

Blue Sharks, Porbeagle Sharks, and Pelagic Sharks (Other Than Porbeagle and Blue Sharks): The 2023 proposed commercial quotas for blue sharks, porbeagle sharks, and pelagic sharks (other than porbeagle or blue sharks) are 273.0 mt dw (601,856 lb dw), 1.7 mt dw (3,748 lb dw), and 488.0 mt dw (1,075,856 lb dw), respectively. On July 1, 2022, NMFS published a final rule that establishes a shortfin mako shark retention limit of zero in commercial and recreational Atlantic HMS fisheries, consistent with a 2021 ICCAT recommendation (87 FR 39373). Retention of shortfin mako sharks was previously permitted, consistent with existing regulations, as part of the pelagic sharks complex. As of July 15, 2022, there have been no porbeagle shark landings, landings of blue sharks were less than 1 percent (<1.0 mt) of their 2022 quota (273.0 mt), and landings of pelagic sharks (other than porbeagle and blue sharks) were at 4 percent (20.6 mt dw) of their 2022 quota (488.0 mt dw). Given that all of these pelagic species are overfished, have overfishing occurring, or have an unknown status, underharvests cannot be carried forward. Based on preliminary estimates of catch rates from previous years, NMFS proposes that the 2023 quotas for blue sharks, porbeagle sharks, and pelagic sharks (other than porbeagle and blue sharks) be equal to their annual base quotas without adjustment.

Shark Research Fishery: The 2023 proposed commercial quotas within the shark research fishery are 50.0 mt dw (110,230 lb dw) for research LCS and

90.7 mt dw (199,943 lb dw) for sandbar sharks. Within the shark research fishery, as of July 15, 2022, preliminary reported landings of research LCS were at 4 percent (2.1 mt dw) of their 2022 quota (50.0 mt dw) and sandbar shark reported landings were at 42 percent (38.2 mt dw) of their 2022 quota (90.7 mt dw). Because sandbar sharks and scalloped hammerhead sharks within the research LCS management group are either overfished or overfishing is occurring, underharvests for these management groups cannot be carried forward. Based on preliminary estimates, NMFS proposes that the 2023 quotas in the shark research fishery be equal to their annual base quotas without adjustment.

Proposed Opening Dates and Retention Limits

In proposing the commercial shark fishing season opening dates for all regions and sub-regions, NMFS considered the “Opening Commercial Fishing Season Criteria,” listed at § 635.27(b)(3):

- The available annual quotas for the current fishing season;
- Estimated season length and average weekly catch rates from previous years;
- Length of the season and fishery participation in past years;
- Temporal variation in behavior or biology of target species (e.g., seasonal distribution or abundance);
- Impact of catch rates in one region on another region;
- Effects of the adjustment on accomplishing the objectives of the 2006 Consolidated HMS FMP and its amendments; and
- Effects of delayed openings.

When analyzing the criteria to open a commercial fishing season, NMFS considers the underharvests of the different management groups in the 2022 fishing year to determine the likely effects of the proposed commercial quotas for 2023 on shark stocks and

fishermen across regional and sub-regional fishing areas. NMFS also examines the potential season length and previous catch rates to ensure, to the extent practicable, that equitable fishing opportunities will be provided to fishermen in all areas. Lastly, NMFS assesses the seasonal variation of the different species and management groups, as well as seasonal variation in fishing opportunities. At the start of each fishing year, the default commercial retention limit is 45 LCS other than sandbar sharks per vessel per trip in the eastern and western Gulf of Mexico sub-regions and in the Atlantic region, unless NMFS determines otherwise and publishes a notice of inseason adjustment in the **Federal Register** (§ 635.24(a)(2)). NMFS may adjust the retention limit from 0 to 55 LCS other than sandbar sharks per vessel per trip if the respective LCS management group is open under §§ 635.27 and 635.28.

NMFS also considered the seven “Inseason Trip Limit Adjustment Criteria” listed at § 635.24(a)(8):

- The amount of remaining shark quota in the relevant area, region, or sub-region, to date, based on dealer reports;
- The catch rates of the relevant shark species/complexes in the region or sub-region, to date, based on dealer reports;
- The estimated date of fishery closure based on when the landings are projected to reach 80 percent of the quota given the realized catch rates and whether they are projected to reach 100 percent before the end of the fishing season;
- Effects of the adjustment on accomplishing the objectives of the 2006 Consolidated HMS FMP and its amendments;
- Variations in seasonal distribution, abundance, or migratory patterns of the relevant shark species based on scientific and fishery-based knowledge;
- Effects of catch rates in one part of a region precluding vessels in another

part of that region from having a reasonable opportunity to harvest a portion of the relevant quota; and/or

- Any shark retention allowance set by ICCAT, the amount of remaining allowance, and the expected or reported catch rates of the relevant shark species, based on dealer and other harvest reports.

When analyzing the inseason adjustment criteria, NMFS examines landings submitted in dealer reports on a weekly basis and catch rates based upon those dealer reports. NMFS has found that, to date, landings and subsequent quotas have not been exceeded. Given the pattern of landings over previous years, seasonal distribution of the species and management groups have not had an effect on the landings within a region or sub-region.

After considering both sets of criteria in §§ 635.24 and 635.28, NMFS is proposing to open the 2023 Atlantic commercial shark fishing season for all shark management groups in the northwestern Atlantic Ocean, including the Gulf of Mexico and Caribbean Sea, on January 1, 2023, after the publication of the final rule for this action (Table 2). NMFS proposes to open the season on January 1, 2023, but recognizes that the actual opening date is contingent upon publication of the final rule in the **Federal Register**, and may vary accordingly. NMFS is also proposing to start the 2023 commercial shark fishing season with the commercial retention limit of 55 LCS other than sandbar sharks per vessel per trip in both the eastern and western Gulf of Mexico sub-regions, and a commercial retention limit of 55 LCS other than sandbar sharks per vessel per trip in the Atlantic region (Table 2). The final retention limits could change as a result of public comments and/or updated catch rates and landings information submitted in dealer reports.

TABLE 2—QUOTA LINKAGES, SEASON OPENING DATES, AND COMMERCIAL RETENTION LIMIT BY REGIONAL OR SUB-REGIONAL SHARK MANAGEMENT GROUP

Region or sub-region	Management group	Quota linkages ¹	Season opening date	Commercial retention limits for directed shark limited access permit holders ²
Western Gulf of Mexico	Blacktip Sharks	Not Linked	January 1, 2023 ...	55 LCS other than sandbar sharks per vessel per trip.
	Aggregate Large Coastal Sharks. Hammerhead Sharks. Blacktip Sharks	Linked.		
Eastern Gulf of Mexico	Aggregate Large Coastal Sharks. Hammerhead Sharks. Blacktip Sharks	Not Linked	January 1, 2023 ...	55 LCS other than sandbar sharks per vessel per trip.
	Aggregate Large Coastal Sharks. Hammerhead Sharks. Non-Blacknose Small Coastal Sharks. Smoothhound Sharks	Linked.		
Gulf of Mexico	Aggregate Large Coastal Sharks. Hammerhead Sharks. Non-Blacknose Small Coastal Sharks. Smoothhound Sharks	Not Linked	January 1, 2023 ...	N/A.
	Aggregate Large Coastal Sharks. Hammerhead Sharks. Non-Blacknose Small Coastal Sharks. Smoothhound Sharks	Not Linked	January 1, 2023 ...	N/A.

TABLE 2—QUOTA LINKAGES, SEASON OPENING DATES, AND COMMERCIAL RETENTION LIMIT BY REGIONAL OR SUB-REGIONAL SHARK MANAGEMENT GROUP—Continued

Region or sub-region	Management group	Quota linkages ¹	Season opening date	Commercial retention limits for directed shark limited access permit holders ²
Atlantic	Aggregate Large Coastal Sharks.	Linked	January 1, 2023 ...	55 LCS other than sandbar sharks per vessel per trip.
	Hammerhead Sharks.	Linked (South of 34° N lat. Only).	January 1, 2023 ...	N/A.
	Non-Blacknose Small Coastal Sharks.			
No Regional Quotas	Blacknose Sharks (South of 34° N lat. Only).	Not Linked	January 1, 2023 ...	N/A.
	Smoothhound Sharks			
	Non-Sandbar LCS Research	Linked ⁴	January 1, 2023 ...	N/A.
	Sandbar Shark Research.	Not Linked	January 1, 2023 ...	N/A.
	Blue Sharks			
	Porbeagle Sharks.			
Pelagic Sharks Other Than Porbeagle or Blue.				

¹ Section 635.28(b)(4) lists species and management groups with quotas that are linked. If quotas are linked, when the specified quota threshold for one management group or species is reached and that management group or species is closed, the linked management group or species closes at the same time (§ 635.28(b)(3)).

² Inseason adjustments are possible.

³ Applies to Shark Directed and Shark Incidental permit holders.

⁴ Shark research permits "terms and conditions" state that when the individual sandbar or research LCS quotas authorized by the permit are landed, all fishing trips under the permit must stop.

In the eastern and western Gulf of Mexico sub-regions, NMFS proposes opening the fishing season on January 1, 2023, for the aggregated LCS, blacktip shark, and hammerhead shark management groups, with a commercial retention limit of 55 LCS other than sandbar sharks per vessel per trip for directed shark permits. This opening date and retention limit combination would provide, to the extent practicable, equitable opportunities across the fisheries management sub-regions. The season opening criteria listed in § 635.27(b)(3) requires NMFS to consider the length of the season for the different species and/or management groups in the previous years (§ 635.27(b)(3)(ii) and (iii)) and whether fishermen were able to participate in the fishery in those years (§ 635.27(b)(3)(iii)). In addition, the criteria listed in § 635.24(a)(8) require NMFS to consider the catch rates of the relevant shark species/complexes based on landings submitted in dealer reports to date (§ 635.24(a)(8)(ii)). NMFS may also adjust the retention limit in the Gulf of Mexico region throughout the season to ensure fishermen in all parts of the region have an opportunity to harvest aggregated LCS, blacktip sharks, and hammerhead sharks (see the criteria listed at §§ 635.27(b)(3)(v) and 635.24(a)(2) and (a)(8)(ii), (v), and (vi)). Given these requirements, NMFS reviewed landings on a weekly basis for all species and/or management groups and determined that fishermen have been able to participate in the fishery, and landings from both Gulf of Mexico sub-regions and the Atlantic region have not exceeded the 2022 overall aggregated LCS quota to date. For both

the eastern and western Gulf of Mexico sub-regions combined, landings submitted in dealer reports received through July 15, 2022, indicate that 66 percent (103.4 mt dw), 55 percent (212.4 mt dw), and 29 percent (5.0 mt dw) of the available aggregated LCS, blacktip shark, and hammerhead shark quotas, respectively, have been harvested. Therefore, for 2023, NMFS is proposing opening both the eastern and western Gulf of Mexico sub-regions with a commercial retention limit of 55 LCS other than sandbar sharks per vessel per trip.

In the Atlantic region, NMFS proposes opening the aggregated LCS and hammerhead shark management groups on January 1, 2023. The criteria listed in § 635.27(b)(3) consider the effects of catch rates in one part of a region precluding vessels in another part of that region from having a reasonable opportunity to harvest a portion of the different species and/or management quotas (§ 635.27(b)(3)(v)). The 2022 data indicate that an opening date of January 1 would provide a reasonable opportunity for fishermen in every part of each region to harvest a portion of the available quotas (§ 635.27(b)(3)(i)), while accounting for variations in seasonal distribution of the different species in the management groups (§ 635.27(b)(3)(iv)). Because the proposed 2023 quotas and season lengths are the same as they were in 2022, NMFS anticipates that the participation of various fishermen throughout the region, would be similar in 2023 (§ 635.27(b)(3)(ii) and (iii)). Additionally, the January 1 opening date appears to meet the objectives of the 2006 Consolidated HMS FMP and

its amendments (§ 635.27(b)(3)(vi)), because it provides equal fishing opportunities for fishermen to fully utilize the available quotas. Considering the reduced landings in the past 5 years, NMFS proposes to open the aggregated LCS and hammerhead shark management groups for the 2023 fishing year on January 1, 2023, with a retention limit of 55 LCS other than sandbar sharks per vessel per trip. Starting with the highest retention limit available could allow fishermen in the Atlantic region to more fully utilize the available science-based quota. As needed, NMFS may adjust the retention limit throughout the year to ensure equitable fishing opportunities throughout the region and ensure the quota is not exceeded (see the criteria at § 635.24(a)(8)). For example, if the quota is harvested too quickly, NMFS could consider reducing the retention limit as appropriate to ensure enough quota remains until later in the year. NMFS would publish in the **Federal Register** notification of any inseason adjustments of the retention limit.

All of the regional or sub-regional commercial fisheries for shark management groups would remain open until December 31, 2023, or until NMFS determines that the landings for any shark management group are projected to reach 80 percent of the quota given the realized catch rates and are projected to reach 100 percent of the quota before the end of the fishing season, or until a quota-linked species or management group is closed. If NMFS determines that a non-quota-linked shark species or management group fishery must be closed, then, consistent with § 635.28(b)(2) for non-

linked quotas (e.g., eastern Gulf of Mexico blacktip sharks, western Gulf of Mexico blacktip sharks, Gulf of Mexico non-blacknose SCS, pelagic sharks, or the Atlantic or Gulf of Mexico smoothhound sharks), NMFS will publish in the **Federal Register** a notice of closure for that shark species, shark management group, region, and/or sub-region. The closure will be effective no fewer than 4 days from the date of filing for public inspection with the Office of the Federal Register.

For the regional or sub-regional Gulf of Mexico blacktip shark management group(s), regulations at § 635.28(b)(5)(i) through (v) authorize NMFS to close the management group(s) before landings have reached, or are projected to reach, 80 percent of the quota after considering the following criteria and other relevant factors: season length based on available sub-regional quota and average sub-regional catch rates; variability in regional and/or sub-regional seasonal distribution, abundance, and migratory patterns of blacktip sharks, hammerhead sharks, and aggregated LCS; effects on accomplishing the objectives of the 2006 Consolidated HMS FMP and its amendments; amount of remaining shark quotas in the relevant sub-region; and regional and/or sub-regional catch rates of the relevant shark species or management groups. The fisheries for the shark species or management group would be closed (even across fishing years) from the effective date and time of the closure until NMFS publishes in the **Federal Register** a notice that additional quota is available and the season is reopened.

If NMFS determines that a quota-linked species and/or management group must be closed, then, consistent with § 635.28(b)(3) for linked quotas, NMFS will publish in the **Federal Register** a notice of closure for all of the species and/or management groups in a linked group. The closure will be effective no fewer than 4 days from the date of filing for public inspection with the Office of the Federal Register. In that event, from the effective date and time of the closure until the season is reopened and additional quota is available (via publication of another notice in the **Federal Register**), the fisheries for all quota-linked species and/or management groups will be closed, even across fishing years. The quota-linked species and/or management groups are: Atlantic hammerhead sharks and Atlantic aggregated LCS; eastern Gulf of Mexico hammerhead sharks and eastern Gulf of Mexico aggregated LCS; western Gulf of Mexico hammerhead sharks and western Gulf of Mexico aggregated LCS;

and Atlantic blacknose sharks and Atlantic non-blacknose SCS south of 34° N latitude.

Request for Comments

Comments on this proposed rule and on NMFS' determination that this proposed rule, if adopted, would not have a significant economic impact on a substantial number of small entities (as discussed below in the Classification section), may be submitted via www.regulations.gov. NMFS solicits comments on this proposed rule by October 11, 2022 (see **DATES** and **ADDRESSES**).

Classification

The NMFS Assistant Administrator has determined that this proposed rule is consistent with the 2006 Consolidated HMS FMP and its amendments, the Magnuson-Stevens Act, and other applicable law, subject to further consideration after public comment.

This rulemaking would implement previously adopted and analyzed measures with adjustments, as specified in the 2006 Consolidated HMS FMP and its amendments, and the Environmental Assessment (EA) that accompanied the 2011 Atlantic shark commercial fishing year rule (75 FR 76302; December 8, 2010). Impacts have been evaluated and analyzed in Amendment 2 (73 FR 35778; June 24, 2008; corrected 73 FR 40658; July 15, 2008), Amendment 3 (75 FR 30484; June 1, 2010; corrected 75 FR 50715; August 17, 2010), Amendment 5a (78 FR 40318; July 3, 2013), Amendment 6 (80 FR 50073; August 18, 2015), and Amendment 9 (80 FR 73128; November 24, 2015) to the 2006 Consolidated HMS FMP, and in the Final Environmental Impact Statements (FEISs) for Amendments 2, 3, and 5a, and the EAs for Amendments 6 and 9. The final rule for Amendment 2 implemented base quotas and quota adjustment procedures for sandbar shark and non-sandbar LCS species/management groups, and Amendments 3 and 5a implemented base quotas for Gulf of Mexico blacktip shark, aggregated LCS, hammerhead shark, blacknose shark, and non-blacknose SCS management groups and quota transfers for Atlantic sharks. The final rule for Amendment 6 implemented a revised commercial shark retention limit, revised base quotas for sandbar shark and non-blacknose SCS species/management groups, new sub-regional quotas in the Gulf of Mexico region for blacktip sharks, aggregated LCS, and hammerhead sharks, and new management measures for blacknose sharks. The final rule for Amendment 9 implemented management measures,

including commercial quotas, for smoothhound sharks in the Atlantic and Gulf of Mexico regions. In 2010, NMFS prepared an EA with the 2011 Atlantic shark commercial fishing year rule (75 FR 76302; December 8, 2010) that describes the impact on the human environment that would result from implementation of measures to delay the start date and allow for inseason adjustments. NMFS has determined that the quota adjustments and season opening dates of this proposed rule and the resulting impacts to the human environment are within the scope of the analyses considered in the FEISs and EAs for these amendments, and additional National Environmental Policy Act analysis is not warranted for this proposed rule.

This action is exempt from review under Executive Order 12866.

The Chief Counsel for Regulation of the Department of Commerce certified to the Chief Counsel for Advocacy of the Small Business Administration (SBA) that this proposed rule, if adopted, would not have a significant economic impact on a substantial number of small entities. The factual basis for this determination is as follows.

This proposed rule would adjust quotas and retention limits and establish the opening date for the 2023 fishing year for the Atlantic commercial shark fisheries. NMFS would adjust quotas as required or allowable based on any overharvests and/or underharvests from the 2022 fishing year. NMFS has limited flexibility to otherwise modify the quotas in this proposed rule. We note that the impacts of the quotas (and any potential modifications based on overharvests or underharvests from the previous fishing year) were analyzed in previous regulatory flexibility analyses, including the initial regulatory flexibility analysis and the final regulatory flexibility analysis that accompanied the 2011 Atlantic shark commercial fishing year rule (75 FR 76302; December 8, 2010). That final rule established the opening dates and quotas for the 2011 fishing season and implemented new adaptive management measures, including flexible opening dates and inseason adjustments to shark trip limits. Consistent with the adaptive management measures implemented in 2011 and based on the most recent data, in this action NMFS proposes the opening date and commercial retention limits to provide, to the extent practicable, fishing opportunities for commercial shark fishermen in all regions and areas.

This proposed rule's measures could affect fishing opportunities for commercial shark fishermen in the

northwestern Atlantic Ocean, Gulf of Mexico, and Caribbean Sea. Section 603(b)(3) of the Regulatory Flexibility Act (RFA) requires agencies to provide an estimate of the number of small entities to which the rule would apply. SBA has established size criteria for all major industry sectors in the United States, including fish harvesters. SBA's regulations include provisions for an agency to develop its own industry-specific size standards after consultation with SBA and to provide an opportunity for public comment (see 13 CFR 121.903(c)). Under this provision, NMFS may establish size standards that differ from those established by the SBA Office of Size Standards, but only for use by NMFS and only for the purpose of conducting an analysis of economic effects in fulfillment of the agency's obligations under the RFA. To utilize this provision, NMFS must publish such size standards in the **Federal Register**, which NMFS did on December 29, 2015 (80 FR 81194; 50 CFR 200.2). In that final rule, effective on July 1, 2016, NMFS established a small business size standard of \$11 million in annual gross receipts for all businesses in the commercial fishing industry (NAICS 11411) for RFA compliance purposes. The 2011 initial regulatory flexibility analysis/final regulatory flexibility analysis analyzed the overall number of limited access permits, which covers all of our active participants today. NMFS

still considers all HMS permit holders to be small entities because they have average annual receipts of less than \$11 million for commercial fishing.

As of June 2022, this proposed rule would apply to the approximately 209 directed commercial shark permit holders, 251 incidental commercial shark permit holders, 198 smoothhound shark permit holders, and 70 commercial shark dealers. Not all permit holders are active in the fishery in any given year. Active directed commercial shark permit holders are defined as those with valid permits that landed one shark based on HMS electronic dealer reports. Of the 460 directed and incidental commercial shark permit holders, to date this year, 15 permit holders landed sharks in the Gulf of Mexico region, and 53 landed sharks in the Atlantic region. Of the 198 smoothhound shark permit holders, to date this year, 60 permit holders landed smoothhound sharks in the Atlantic region, and only 1 landed smoothhound sharks in the Gulf of Mexico region. As described below, NMFS has determined that all of these entities are small entities for purposes of the RFA.

Based on the 2022 ex-vessel prices (Table 3), fully harvesting the unadjusted 2023 Atlantic shark commercial base quotas could result in estimated total fleet revenues of \$9,779,528. For adjusted management groups, the following are changes in

potential revenues resulting from the adjustments proposed in this rule. For the Gulf of Mexico blacktip shark management group, NMFS is proposing to adjust the base sub-regional quotas upward due to underharvests in 2022. The increase for the western Gulf of Mexico blacktip shark management group could result in a potential \$196,451 gain in total revenues for fishermen in that sub-region, while the increase for the eastern Gulf of Mexico blacktip shark management group could result in a potential \$34,094 gain in total revenues for fishermen in that sub-region. For the Gulf of Mexico and Atlantic smoothhound shark management groups, NMFS is proposing to increase the base quotas due to underharvest in 2022. This would cause a potential gain in revenue of \$463,518 for the fleet in the Gulf of Mexico region, and a potential gain in revenue of \$1,377,619 for the fleet in the Atlantic region. Since a small business is defined as having annual receipts not in excess of \$11 million, and each individual shark fishing vessel would be its own entity, the total Atlantic shark fishery is within the small entity definition since the total revenue is less than \$12 million (*i.e.*, the estimated total fleet revenues plus the potential gain in revenues due to underharvest). NMFS has also determined that the proposed rule would not likely affect any small governmental jurisdictions.

TABLE 3—AVERAGE EX-VESSEL PRICES PER lb dw FOR EACH SHARK MANAGEMENT GROUP, 2022

Region	Species	Average ex-vessel meat price	Average ex-vessel fin price
Western Gulf of Mexico	Blacktip Shark	\$0.77	
	Aggregated LCS	0.70	
	Hammerhead Shark	0.70	
Eastern Gulf of Mexico	Blacktip Shark	1.23	
	Aggregated LCS	1.03	
	Hammerhead Shark	0.91	
Gulf of Mexico	Non-Blacknose SCS	0.69	
	Smoothhound Shark	1.25	
Atlantic	Aggregated LCS	1.21	
	Hammerhead Shark	0.69	
	Non-Blacknose SCS	1.16	
	Blacknose Shark	1.47	
	Smoothhound Shark	1.04	
No Region	Shark Research Fishery (Aggregated LCS)	0.97	
	Shark Research Fishery (Sandbar only)	1.15	
	Blue shark		
	Porbeagle shark		
	Other Pelagic sharks	1.44	
All	Shark Fins		\$6.04
Atlantic	Shark Fins		1.80
GOM	Shark Fins		8.58

All of these changes in gross revenues are similar to the gross revenues analyzed in the 2006 Consolidated HMS

FMP and its Amendments 2, 3, 5a, 6, and 9. The final regulatory flexibility analyses for those amendments

concluded that the economic impacts on these small entities from adjustments such as those contemplated in this

action are expected to be minimal. In accordance with the 2006 Consolidated HMS FMP, as amended, NMFS now conducts annual rulemakings in which NMFS considers the potential economic impacts of adjusting the quotas for underharvests and overharvests. For the adjustments included in this proposed rule, NMFS concludes that the effects this proposed rule would have on small entities would be minimal.

In conclusion, although this proposed rule would adjust quotas and retention limits and establish the opening date for the 2023 fishing year for the Atlantic commercial shark fisheries, this proposed rule does not change the regulations and management measures currently in place that govern commercial shark fishing in Federal waters of the northwestern Atlantic

Ocean, Gulf of Mexico, and Caribbean Sea. Furthermore, as described above, this action is not expected to affect the amount of sharks caught and sold or result in any change in the ex-vessel revenues those fishermen could expect, because, for the most part, the proposed quotas, retention limits (except for shortfin mako shark), and opening dates are the same as those for last year. In addition, as described above, for the areas in which this action proposes adjustments, the increases in revenues for the participating small entities are minimal. Therefore, NMFS has determined that this proposed rule, if adopted, would not have a significant economic impact on a substantial number of small entities. As a result, an initial regulatory flexibility analysis is

not required and none has been prepared. NMFS invites comments from the public on the information in this determination that this proposed rule, if adopted, would not have a significant economic impact on a substantial number of small entities.

This proposed rule contains no information collection requirements under the Paperwork Reduction Act of 1995.

Authority: 16 U.S.C. 971 *et seq.*; 16 U.S.C. 1801 *et seq.*

Dated: September 6, 2022.

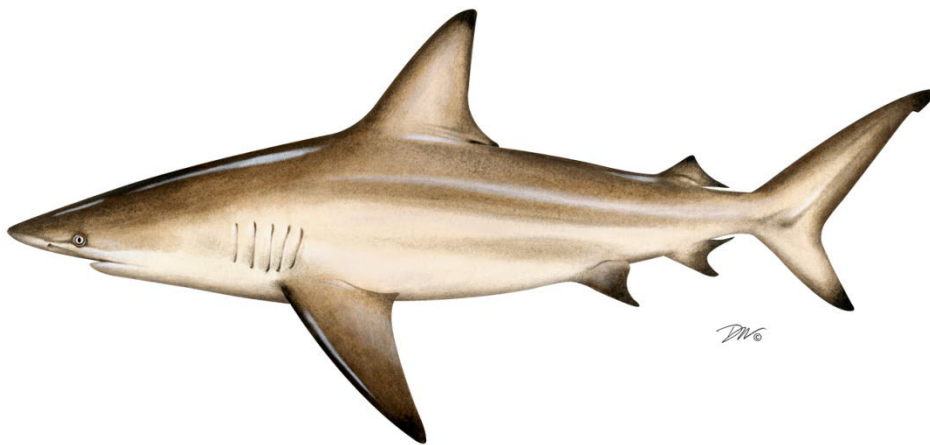
Samuel D. Rauch, III,

*Deputy Assistant Administrator for
Regulatory Programs, National Marine
Fisheries Service.*

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BILLING CODE 3510-22-P

ATLANTIC STATES MARINE FISHERIES COMMISSION
REVIEW OF THE INTERSTATE FISHERY MANAGEMENT PLAN
FOR COASTAL SHARKS
2020 FISHING YEAR



Prepared by the Coastal Sharks Plan Review Team

June 2022

REVIEW OF THE ASMFC FISHERY MANAGEMENT PLAN AND STATE COMPLIANCE FOR COASTAL SHARKS FOR THE 2020 FISHERY

Management Summary

<u>Date of FMP Approval:</u>	August 2008
<u>Amendments:</u>	None
<u>Addenda:</u>	Addendum I (September 2009) Addendum II (May 2013) Addendum III (October 2013) Addendum IV (August 2016) Addendum V (October 2018)
<u>Management Unit:</u>	Entire coastwide distribution of the resource from the estuaries eastward to the inshore boundary of the EEZ
<u>States With Declared Interest:</u>	Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, Florida
<u>Active Boards/Committees:</u>	Coastal Shark Management Board, Advisory Panel, Technical Committee, and Plan Review Team

I. Status of the Fishery Management Plan

The Atlantic States Marine Fisheries Commission (ASMFC; Commission) adopted its first [fishery management plan \(FMP\) for coastal sharks in 2008](#). Coastal sharks were initially managed under this plan as six different complexes: prohibited, research, small coastal, non-sandbar large coastal, pelagic and smooth dogfish. The Board does not actively set quotas for any shark species. The Commission follows National Oceanic and Atmospheric Administration's (NOAA Fisheries) openings and closures for small coastal sharks, non-sandbar large coastal shark, and pelagic sharks. Species in the prohibited category may not be possessed or taken. Sandbar sharks may only be taken with a shark fishery research permit. All species must be landed with their fins attached to the carcass by natural means. This was adjusted through subsequent addenda listed below. The Interstate Fishery Management Plan for Coastal Sharks (FMP) established the following goals and objectives.

GOAL

The goal of the Interstate Fishery Management Plan for Coastal Sharks is “to promote stock rebuilding and management of the coastal shark fishery in a manner that is biologically, economically, socially, and ecologically sound.”

OBJECTIVES

In support of this goal, the following objectives for the FMP include:

1. Reduce fishing mortality to rebuild stock biomass, prevent stock collapse, and support a sustainable fishery.
2. Protect essential habitat areas such as nurseries and pupping grounds to protect sharks during particularly vulnerable stages in their life cycle.
3. Coordinate management activities between state and federal waters to promote complementary regulations throughout the species' range.
4. Obtain biological and improved fishery related data to increase understanding of state water shark fisheries.
5. Minimize endangered species bycatch in shark fisheries.

The FMP has been adapted through the following addenda:

[Addendum I \(September 2009\)](#)

Approved in September 2009, Addendum I modified the FMP to allow commercial fishermen to process (remove the fins of) smooth dogfish at sea from March – June of each year, but also requires a 5-95% fin to carcass ratio for all dressed smooth dogfish carcasses. This Addendum also removed recreational smooth dogfish possession limits, as well as the 2-hour gill-net check requirement for commercial fishermen, which applied to all shark species.

[Addendum II \(May 2013\)](#)

Approved in May 2013, Addendum II modified Addendum I to allow commercial fishermen to process (remove the fins of) smooth dogfish at sea year-round but requires a 12-88% fin-to-carcass ratio for all dressed smooth dogfish carcasses. This ratio was consistent with the Shark Conservation Act of 2010. Addendum II also allocates state-shares of the upcoming federal smoothhound shark quota based on historical landings from 1998-2010.

[Addendum III \(October 2013\)](#)

Addendum III modifies the species groups to ensure consistency with NOAA Fisheries. It creates two new species groups (Blacknose and Hammerhead Species Groups). The addendum also increases the recreational minimum size limit for all hammerhead species to 78" fork length.

[Addendum IV \(August 2016\)](#)

Addendum IV allows smooth dogfish carcasses to be landed with corresponding fins removed from the carcass as long as the total retained catch, by weight, is composed of at least 25 percent smooth dogfish, consistent with federal management measures.

[Addendum V \(October 2018\)](#)

Addendum V allows the Board to respond to changes in the stock status of coastal shark populations and adjust regulations through Board action rather than an addendum, ensuring greater consistency between state and federal shark regulations. Addendum V allows the Board to change a suite of commercial and recreational measures, such as recreational size and possession limits, season length, and area closures (recreational and commercial), in addition to the current specifications for just the commercial fishery, throughout the year when needed.

Under this provision, if the Board chooses to adjust measures through Board action, the public will be able to provide comment prior to Board meetings, as well as at Board meetings at the discretion of the Board Chair. Additionally, the Board can still implement changes in shark regulations through an addendum.

In 2019, in response to measures implemented by NOAA Fisheries through Amendment 11 for Federal Highly Migratory Species (HMS) Permit Holders, the Board approved changes to the recreational size limit for Atlantic shortfin mako sharks in state waters, specifically, a 71-inch straight line fork length (FL) for males and an 83-inch straight line FL for females. These measures were implemented in response to the 2017 Atlantic shortfin mako stock assessment that found the resource is overfished and experiencing overfishing. The states were required to implement the changes to the recreational minimum size limit for Atlantic shortfin mako by January 1, 2020.

Additionally in 2019, the Board moved to require non-offset circle hooks for the recreational shark fishery in state waters with an implementation date of July 1, 2020. The Board chose to do so after NOAA Fisheries requested that the states implement a circle hook requirement for the recreational fishery consistent with the measures approved in HMS Amendment 11.

Table 1. List of commercial shark management groups

Species Group	Species within Group
Prohibited	Sand tiger, bigeye sand tiger, whale, basking, white, dusky, bignose, Galapagos, night, reef, narrowtooth, Caribbean sharpnose, smalltail, Atlantic angel, longfin mako, bigeye thresher, sharpnose sevengill, bluntnose sixgill and bigeye sixgill sharks
Research	Sandbar sharks
Non-Blacknose Small Coastal	Atlantic sharpnose, finetooth, and bonnethead sharks
Blacknose	Blacknose sharks
Aggregated Large Coastal	Silky, tiger, blacktip, spinner, bull, lemon, and nurse sharks
Hammerhead	Scalloped hammerhead, great hammerhead and smooth hammerhead
Pelagic	Shortfin mako*, porbeagle, common thresher, oceanic whitetip and blue sharks
Smoothhound	Smooth dogfish and Florida smoothhound sharks

*Final rule for zero retention of shortfin mako sharks is expected to be posted in July of 2022.

II. Status of the Stocks

Stock status is assessed by species or by species complex if there are not enough data for an individual assessment. Nine species have been assessed domestically, three species have been assessed internationally, and the rest have not been assessed. Table 2 describes the current stock status of all assessed shark species along with references for the stock assessments.

In December 2020, Southeast Data and Assessment Review SEDAR completed a benchmark assessment of the Atlantic blacktip shark (*Carcharhinus limbatus*) stock ([SEDAR 65](#)), which indicates the stock is not overfished and not experiencing overfishing.

In June 2020, the [International Commission on the Convention of Atlantic Tunas \(ICCAT\)'s Standing Committee on Research and Statistics \(SCRS\)](#) completed an assessment of Porbeagle sharks (*Lamna nasus*), which indicates the stock is overfished and not experiencing overfishing. As a result of the previous 2009 assessment, NOAA Fisheries established a 100-year rebuilding plan for porbeagle sharks; the expected rebuilding date is 2108.

The 2017 ICCAT assessment of the North Atlantic population of shortfin mako (*Isurus oxyrinchus*) indicates that the stock is overfished and overfishing is occurring. Multiple models were explored and new data sources were integrated. Combined probability of overfishing occurring and the stock being in an overfished state was 90% across all models.

The 2017 stock assessment ([SEDAR 54](#)) for sandbar sharks (*Carcharhinus plumbeus*) indicates the stock is overfished and not experiencing overfishing. This assessment used a new approach (Stock Synthesis) instead of the State Space Age Structure Production Model that was used in the previous assessment ([SEDAR 21](#)). A replication analysis conducted using the prior model (updated with data through 2015) resulted in the same stock status as the new model (overfished, no overfishing occurring). The rebuilding date for sandbar sharks is 2070.

The 2016 stock assessment update ([SEDAR 21](#)) for Atlantic dusky sharks (*Carcharhinus obscurus*) indicates the stock is overfished and experiencing overfishing. This latest review functioned as an update to the 2011 assessment, so no new methodology was introduced. However, all model inputs were updated with more recent data (i.e., 2010-2015 effort, observer, and survey data). The rebuilding plan for dusky sharks is 2107.

In 2015, a benchmark stock assessment ([SEDAR 39](#)) was conducted for the smoothhound complex, including smooth dogfish (*Mustelus canis*), the only species of smoothhound occurring in the Atlantic. The assessment indicates Atlantic smooth dogfish are not overfished and not experiencing overfishing.

The North Atlantic blue shark (*Prionace glauca*) stock was assessed by [ICCAT's SCRS](#) in 2015. Similar to the results of the previous 2008 stock assessment, the assessment indicated the stock is not overfished and not experiencing overfishing. However, scientists acknowledge there is a high level of uncertainty in the data inputs and model structural assumptions; therefore, the assessment results should be interpreted with caution.

[SEDAR 34](#) (2013) assessed the status of Atlantic sharpnose sharks (*Rhizoprionodon terraenovae*) and bonnetheads (*Sphyrna tiburo*). The Atlantic sharpnose shark stock is not overfished and not experiencing overfishing. The stock status of bonnethead stocks (Atlantic and Gulf of Mexico) is considered unknown. Assessment results indicated the stock is not overfished with no

overfishing occurring, however all available data pointed towards separate stocks. As the assessment framework would not allow stocks to be split, the assessment continued under a single stock scenario. The results of the assessment were rejected by reviewers noting that the stocks need to be assessed independently. A benchmark assessment is recommended for both stocks of bonnetheads.

A 2011 benchmark assessment ([SEDAR 21](#)) of blacknose sharks (*Carcharhinus acrontus*) indicated the stock is overfished and experiencing overfishing. As described in the Magnuson-Stevens Act, NOAA Fisheries must establish a rebuilding plan for an overfished stock. As such, the rebuilding date for blacknose sharks is 2043.

The 2007 [SEDAR 13](#) assessed the SCS complex, finetooth (*Carcharhinus isodon*), Atlantic sharpnose (*Rhizoprionodon terraenovae*), and bonnethead (*Sphyrna tiburo*) sharks (SEDAR 2007). The SEDAR 13 peer reviewers considered the data to be the 'best available at the time' and determined the status of the SCS complex to be adequate. Finetooth, Atlantic sharpnose, and bonnethead were all considered to be not overfished and not experiencing overfishing.

A 2009 stock assessment for the Northwest Atlantic and Gulf of Mexico populations of scalloped hammerhead sharks (*Sphyrna lewini*) indicated the Northwest Atlantic stock is overfished and experiencing overfishing (Hayes et al. 2009). This assessment was reviewed by NOAA Fisheries and deemed appropriate to serve as the basis for U.S. management decisions. In response to the assessment findings, NOAA Fisheries established a scalloped hammerhead rebuilding plan that will end in 2023. However, since the assessment, research has determined that in the U.S. Atlantic, a portion of animals considered scalloped hammerheads are actually a cryptic species, recently named the Carolina hammerhead (*Sphyrna gilberti*; Quattro et al. 2013). Little to no species-specific information exists regarding the distribution, abundance and life history of the two species, therefore for now, both species are currently managed under the name scalloped hammerhead. A research track assessment of the hammerhead complex ([SEDAR 77](#)) is ongoing.

Table 2. Stock Status of Atlantic Coastal Shark Species and Species Groups

Species or Complex Name	Stock Status		References/Comments
	Overfished	Overfishing	
Pelagic			
Porbeagle	Yes	No	Porbeagle Stock Assessment, ICCAT Standing Committee on Research and Statistics Report (2020); Rebuilding ends in 2108 (HMS Am. 2)
Blue	No	No	ICCAT Standing Committee on Research and Statistics Report (2015)
Shortfin mako	Yes	Yes	ICCAT Standing Committee on Research and Statistics Report (2017)
All other pelagic sharks	Unknown	Unknown	
Aggregated Large Coastal Sharks (LCS)			
Atlantic Blacktip	No	No	SEDAR 65 (2020)
Aggregated Large Coastal Sharks - Atlantic Region	Unknown	Unknown	SEDAR 11 (2006); difficult to assess as a species complex due to various life history characteristics/ lack of available data
Non-Blacknose Small Coastal Sharks (SCS)			
Atlantic Sharpnose	No	No	SEDAR 34 (2013)
Bonnethead	Unknown	Unknown	SEDAR 34 (2013)
Finetooth	No	No	SEDAR 13 (2007)
Hammerhead			
Scalloped	Yes	Yes	SEFSC Scientific Review by Hayes et al. (2009); Rebuilding ends in 2023 (HMS Am. 5a)
Blacknose			
Blacknose	Yes	Yes	SEDAR 21 (2010); Rebuilding ends in 2043 (HMS Am. 5a)
Smoothhound			
Atlantic Smooth Dogfish	No	No	SEDAR 39 (2015)
Research			
Sandbar	Yes	No	SEDAR 54 (2017); Rebuilding ends 2070 (HMS Am. 2)
Prohibited			
Dusky	Yes	Yes	SEDAR 21 update (2016); Rebuilding ends in 2108 (HMS Am. 5b)
All other prohibited sharks	Unknown	Unknown	

III. Status of the Fishery

Specifications (Opening, closures, quotas)

NOAA Fisheries sets quotas for coastal sharks through the 2006 Consolidated Atlantic Highly Migratory Species Fishery Management Plan and its amendments. The opening dates, closure dates, and quotas are detailed in Table 3. All non-prohibited coastal shark management groups opened on January 1, 2020. NOAA Fisheries closes commercial shark fisheries when 80% of the available quota is reached. When the fishery closes in federal waters, the Interstate FMP dictates that the fishery also closes in state waters. For 2020, the fishery did not close for any of the species groups before December 31.

Table 3. Commercial quotas and opening dates for 2020 shark fishing season

Species Group	Region	2020 Annual Quota (mt dw)	Season Opening Dates
Aggregated Large Coastal Sharks (LCS)	Atlantic	168.9	January 1, 2020
Hammerhead Sharks	Atlantic	27.1	
Non-Blacknose Small Coastal Sharks (SCS)	Atlantic	264.1	January 1, 2020
Blacknose Sharks (South of 34° N. Latitude only)	Atlantic	17.2	
Smoothhound sharks	Atlantic	1,802.6	January 1, 2020
Blue Sharks	No regional quotas	273.0	January 1, 2020
Porbeagle Sharks		1.7	
Pelagic Sharks other than Porbeagle or Blue		488.0	
Shark Research Quota (Aggregated LCS)		50.0	
Sandbar Research Quota		90.7	

Commercial Landings

Preliminary commercial landings of Atlantic large coastal shark species in 2020 were 227,783 pounds (lbs) dressed weight (dw), roughly a 30% increase from 2019 landings (Table 4; Figure 1). Commercial landings of small coastal shark species in 2020 were 234,557 lbs dw, a 28% decrease from 2019 landings (Table 5; Figure 1). Landings for small coastal shark species in 2016 were the lowest for the time series over the last 10 years and a result of the early closure of both blacknose and non-blacknose sharks south of 34°00' N latitude on May 29, 2016.

Commercial landings of Atlantic pelagic sharks in 2020 were 98,514 lbs dw, which represents an approximate 6% decrease from 2019 landings (Table 6; Figure 1).

Table 4. Commercial landings of authorized Atlantic large coastal sharks by species (lbs dw), 2012-2020. Source: NOAA Fisheries Stock Assessment and Fisheries Evaluation Report, March 2022. Confidential landings denoted with a "C".

Species	2012	2013	2014	2015	2016	2017	2018	2019	2020
Great hammerhead	371	7,406	13,538	36,892	20,454	17,646	22,881	26,410	27,529
Scalloped hammerhead	15,800	27,229	24,652	13,197	12,329	4,919	5,927	C	12,024
Smooth hammerhead	3,967	1,521	601	304	125	1,193	530	661	0
Unclassified	9,617	0	0	0	0	0	0	0	0
Hammerhead Total	29,755	36,156	38,791	50,393	32,908	23,758	29,338	<35,000	39,553
Blacktip	215,403	256,277	282,009	229,823	248,470	205,138	125,129	88,655	131,962
Bull	24,504	33,980	32,372	33,737	31,417	23,802	16,707	14,677	17,703
Lemon	21,563	16,791	13,047	18,158	19,205	12,005	8,910	5,096	4,479
Nurse	81	0	0	24	0	0	0	C	0
Silky	29	186	289	1,246	446	702	175	495	223
Spinner	10,643	26,892	25,716	33,002	55,610	62,314	58,347	59,066	71,094
Tiger	23,245	16,561	29,062	28,460	14,896	6,324	4,073	4,685	2,232
Unclassified	53,705	0	0	0	0	0	0	0	90
Aggregated LCS Total	349,173	350,687	382,495	344,450	370,045	310,286	213,341	<175,000	227,783
Sandbar	46,446	46,868	82,308	112,610	114,871	121,074	132,688	150,010	49,989

Table 5. Commercial landings of authorized Atlantic small coastal sharks by species (lbs dw), 2012-2020. Source: NOAA Fisheries Stock Assessment and Fisheries Evaluation Report, March 2022.

Species	2012	2013	2014	2015	2016	2017	2018	2019	2020
Blacknose	37,873	33,382	38,437	45,405	26,842	17,241	11,335	18,910	10,644
Bonnethead	19,907	22,845	13,221	5,885	1,688	6,077	4,240	4,134	1,818
Finetooth	15,922	19,452	19,026	8,712	5,647	19,874	17,071	9,688	7,793
Atl. Sharpnose	345,625	183,524	198,568	293,128	175,890	251,289	268,395	292,694	214,303
SCS Total	419,819	259,203	269,252	353,130	210,067	294,481	301,041	325,426	234,557

Table 6. Commercial landings of authorized pelagic sharks by species off the Atlantic coast of the United States (lbs dw), 2012-2020. Source: NOAA Fisheries Stock Assessment and Fisheries Evaluation Report, March 2022. Confidential landings denoted with a “C”.

Species	2012	2013	2014	2015	2016	2017	2018	2019	2020
Blue	17,200	9,767	17,806	1,114	607	4272	C	0	0
Porbeagle	4,250	54	6414	0	0	C	811	C	0
Shortfin Mako	198,841	199,177	218,295	141,720	160,829	184,993	57,719	53,573	36,029
Unclassified Mako	0	0	0	0	0	0	0	0	0
Oceanic whitetip	258	62	22	0	0	0	0	0	0
Thresher	63,965	48,768	116,012	72,463	78,219	61,990	63,805	51,170	62,485
Unclassified pelagic	28,932	0	0	0	0	0	0	0	0
Pelagic Total	313,446	257,828	358,549	215,297	239,655	<255,000	<125,000	<105,000	98,514

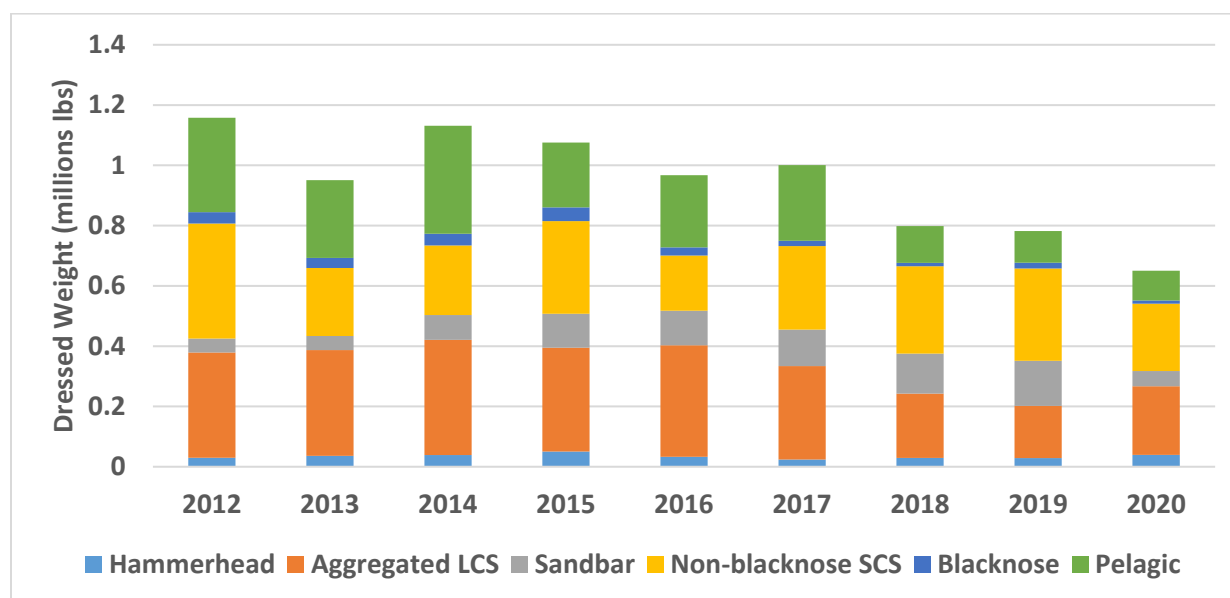


Figure 1: Commercial landings of coastal sharks off the east coast of the United States by species group, 2012-2020. Source: NOAA Fisheries Stock Assessment and Fisheries Evaluation Report, March 2022.

Recreational Landings

By species group, 39,342 LCS, 5 hammerhead, 63,891 SCS, 61,129 smoothhound, and 237 sandbar sharks were harvested during the 2020 recreational fishing season (Table 7; Figure 2). Pelagic shark data for 2016-2020 are reported in metric tons whole weight, and in 2020 91.9 mt of pelagic sharks were harvested. In 2020, recreational harvest of prohibited Atlantic shark species was 58, reaching a 5-year low (Table 8).

Table 7. Estimated recreational harvest of Atlantic shark species by species group in numbers of fish, 2012-2020. Source: NOAA Fisheries Stock Assessment and Fisheries Evaluation Report, March 2022.

Species	2012	2013	2014	2015	2016	2017	2018	2019	2020
Blacktip	1,164	962	1,730	1,718	6,520	1,527	500	224	1,506
Bull	68	77	3	2	26	3,750	32	0	17
Lemon	0	0	0	144	1,207	764	0	4	0
Nurse	706	13	418	298	21	2	5	13	2
Spinner	1,145	390	847	82	761	623	153	66	27
Tiger	2	8	324	417	2,061	0	1	0	0
Unclassified	6,070	97	4,513	153	732	625	7,544	83,129	37,790
LCS Total	9155	1547	7835	2814	11328	7291	8235	83436	39342
Hammerhead Total	41	600	900	1	799	0	0	2	5
Blue shark¹	0	4,165	3,449	9,421	30.8	21.9	15.2	16.7	8.4
Mako, shortfin¹	1,314	6,856	16,531	12,835	167.5	192.4	125.1	25.2	24.5
Oceanic whitetip¹	0	0	0	132	0	0	0	0	0
Porbeagle¹	0	0	0	0	4.3	7.7	2.8	11.8	4.9
Thresher¹	0	0	3,164	12,274	74.3	92	96.6	108.8	54.1
Pelagic Total¹	1314	11021	23144	34662	276.9	314	239.7	162.5	91.9
Blacknose	0	70	4,146	1,211	225	13	13	83	661
Bonnethead	9,798	14,376	28,532	2,870	37,832	18,239	37,168	31,086	28,861
Finetooth	0	0	2,896	326	0	1,219	0	176	113
Atlantic sharpnose	23,207	44,832	56,052	28,869	155,023	38,784	24,468	40,144	34,256
SCS Total	33005	59278	91626	33276	193,080	58,255	61,649	71,489	63,891
Smoothhound	31,669	17,308	49,835	43,721	145,689	58,446	40,736	56,375	61,129
Sandbar²	857	399	1,873	1,252	0	2,604	0	792	237

¹Pelagic shark data for 2012-2015 includes Gulf of Mexico landings in numbers of fish. Pelagic shark data for 2016-2020 is Atlantic only, but reported in metric tons whole weight.

²Sandbar shark data for 2016-2020 were pulled from the Marine Recreational Information Program.

Table 8. Estimated recreational harvest of prohibited Atlantic shark species in numbers of fish, 2012-2020. Source: NOAA Fisheries Stock Assessment and Fisheries Evaluation Report, March 2022.

Species	2012	2013	2014	2015	2016	2017	2018	2019	2020
Atlantic angel	0	0	0	0	113	98	31	29	24
Basking	0	0	0	0	8	4	8	3	3
Bigeye sand tiger	0	0	0	0	0	0	0	0	0
Bigeye sixgill	0	0	0	0	0	0	0	0	0
Bigeye thresher	0	0	0	0	28	21	13	24	2
Bignose	0	0	0	0	1	0	0	0	1
Caribbean reef	0	0	0	0	0	0	1	0	0
Caribbean sharpnose	0	0	0	0	0	0	0	0	0
Dusky	15	16	2	0	29	22	121	19	4
Galapagos	0	0	0	0	0	0	0	0	0
Longfin mako	0	0	0	0	15	14	4	14	0
Narrowtooth	0	0	0	0	0	0	0	0	0
Night	0	0	0	0	8	31	74	83	0
Sand tiger	0	0	0	0	26	9	48	20	23
Sevengill	0	0	0	0	0	0	0	0	0
Sixgill	0	0	0	0	0	1	0	0	0
Whale	0	0	0	0	0	0	0	0	0
White	0	0	0	0	0	10	5	3	1
Prohibited Total	15	16	2	0	228	210	305	195	58

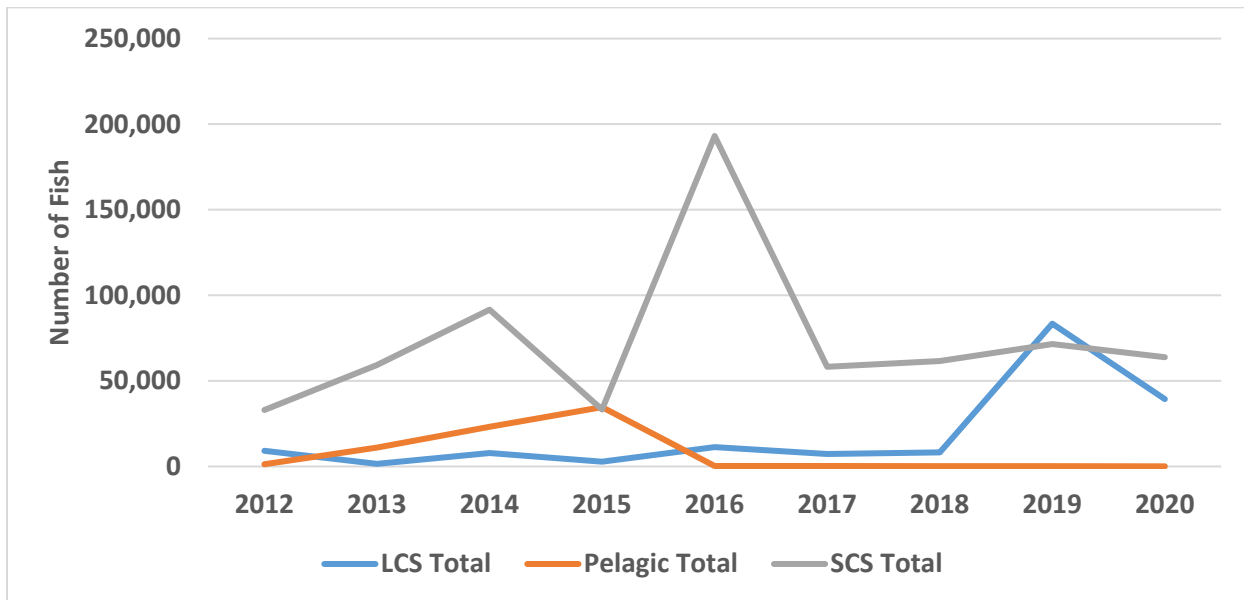


Figure 2: Estimated recreational harvest for LCS, pelagic, and SCS by species group, in numbers of fish, 2012-2020. Source: NOAA Fisheries Stock Assessment and Fisheries Evaluation Report, March 2022.

IV. Status of Research and Monitoring

Under the Interstate Fishery Management for Coastal Sharks, the states are not required to conduct any fishery-dependent or independent studies; however, states are encouraged to submit any information collected while surveying for other species. This section describes the research and monitoring efforts through the 2020 fishing year, where available.

The Cooperative Atlantic States Shark Pupping and Nursery (COASTSPAN) Survey appears in multiple state monitoring efforts. The survey monitors the presence of young-of-year and juvenile sharks along the east coast. It is managed and coordinated by NOAA's Northeast Fisheries Science Center (NEFSC) through the Apex Predators Program based at the NEFSC's Narragansett Laboratory in Rhode Island. Longline and gillnet sampling, along with mark-recapture techniques are used to determine relative abundance, distribution, and migration of sharks utilizing nursery grounds from Massachusetts to Florida. In 2020, COASTSPAN program participants were the Virginia Institute of Marine Science, South Carolina Department of Natural Resources, and University of North Florida (samples Georgia and north Florida state waters). In addition, the survey is conducted in summer months in Narragansett and Delaware Bays. Standardized indices of abundance from COASTSPAN surveys are used in the stock assessments for large and small coastal sharks.

Massachusetts

DMF intensified its research on the fine-scale predatory behavior of white sharks off the coast of Massachusetts using a variety of methods. First, the existing acoustic receiver array was expanded to fill gaps around Cape Cod and to include the majority of towns along the Massachusetts coastline. Second, tagging and survey efforts were expanded into Cape Cod Bay. Third, two gridded acoustic arrays were deployed off Head of the Meadow Beach (Truro) and Nauset (Orleans) beaches with the Center for Coastal Studies to examine fine-scale movements of sharks as they relate to the habitat. Fourth, five real-time acoustic receivers were deployed off popular Outer Cape swimming beaches including: Newcomb Hollow and Lecounts (Wellfleet), Head of the Meadow (Truro), Nauset Trail (Orleans), and North Beach (Chatham). The receivers provided beach managers and lifeguards with immediate notifications when acoustically-tagged white sharks were detected close to these beaches. Fifth, acceleration data logging camera tags were deployed on white sharks to record very fine-scale movements at sub-second intervals, including tailbeat frequency, amplitude, body posture, and swimming depth. These data will be used to examine swimming patterns (e.g., traveling, resting, hunting, foraging, mating), bioenergetics, and, ultimately, provide estimates of the intensity of white shark predation on gray seals. Sixth, a fixed aerial camera system was tested in Orleans as a potential tool to observe nearshore white shark behavior.

As a result, 38 white sharks were tagged with acoustic transmitters off the Outer Cape in 2020; eight of these also carried acceleration data logging camera tags for up to two days. This brings the total to 230 individuals tagged since 2009. These efforts were conducted with funding and logistical support from local nonprofits, including the Atlantic White Shark Conservancy. Data

collected in 2020 will be used to enhance our understanding of white shark predatory behavior in these areas of high shark-human overlap to better inform public safety practices.

Rhode Island

Fishery-independent monitoring is limited to coastal shark species taken in the RI Division of Fish & Wildlife, Marine Fisheries Section (RIDEM DMF) monthly and seasonal trawl survey. Smooth dogfish are the only coastal shark species captured in the trawl survey regularly. A summary of fishery-independent monitoring for coastal sharks is summarized in Figure 3 below.

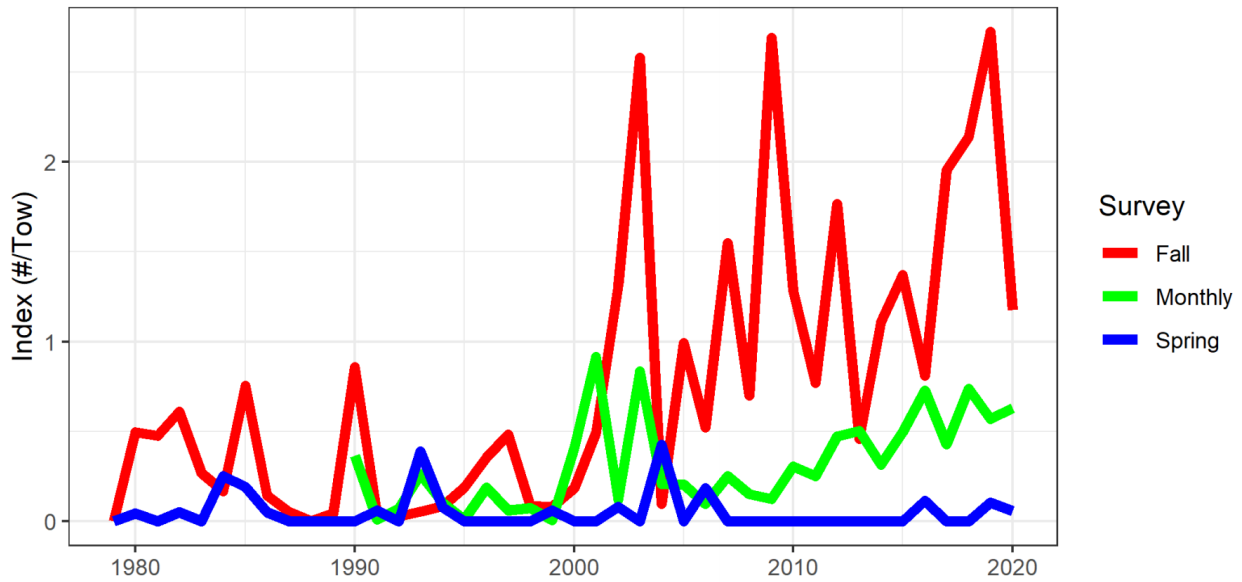


Figure 3. Smooth dogfish (*Mustelus canis*) annual mean number per tow from the RIDEM DMF bottom trawl surveys.

Connecticut

The Connecticut Department of Energy and Environmental Protection (CT DEEP) monitors the abundance of marine resources in nearby coastal waters with the Long Island Sound Trawl Survey. Spring (April, May and June) and fall (September and October) surveys are conducted each year. Other than smooth dogfish, coastal sharks are not encountered by the Long Island Sound Trawl Survey. Smooth dogfish are caught most often in the fall and the fall indices are presented below (Table 9; Figure 4). Due to the COVID-19 pandemic, the Long Island Sound Trawl Survey was not conducted in 2020. More information on the Long Island Sound Trawl Survey report can be found [here](#).

Table 9. Long Island Trawl Survey Fall Smooth Dogfish indices (geometric mean catch/tow)

Year	Kg/tow	Count/tow
1984		2.47
1985		1.92
1986		1.43

1987		0.81
1988		0.91
1989		0.41
1990		0.55
1991		0.46
1992	1.20	0.78
1993	1.75	0.95
1994	0.76	0.49
1995	0.85	0.46
1996	1.16	0.80
1997	1.09	0.59
1998	1.32	0.72
1999	1.27	0.93
2000	2.85	1.88
2001	3.02	1.69
2002	6.09	3.58
2003	6.18	3.10
2004	2.95	1.44
2005	2.70	1.41
2006	2.46	0.94
2007	6.23	2.27
2008	1.25	0.63
2009	2.8	1.13
2010	-	-
2011	3.66	1.43
2012	4.69	2.41
2013	7.93	4.13
2014	11.05	5.78
2015	11.70	7.30
2016	8.30	5.24
2017	14.82	8.29
2018	9.57	7.17
2019	10.66	6.01
2010	-	-

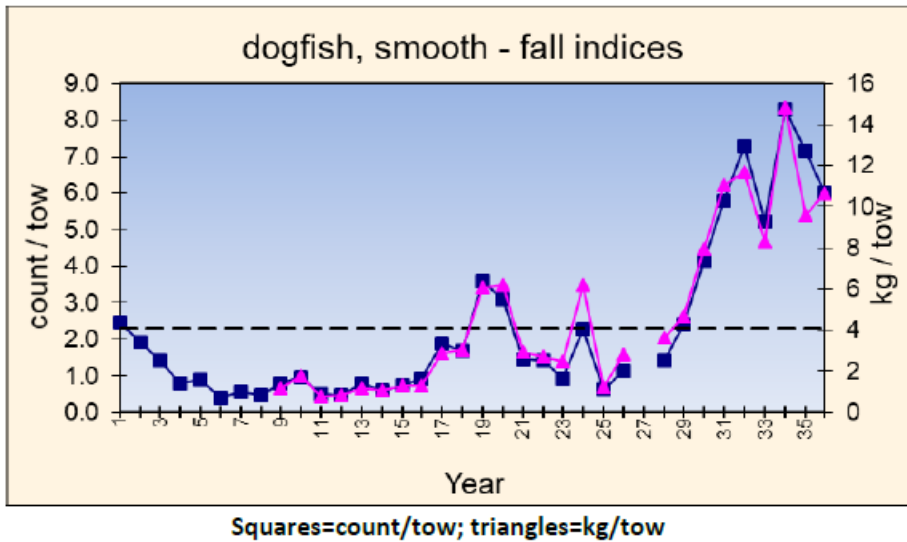


Figure 4. CT DEEP Smooth Dogfish Long Island Sound Trawl Survey

New York

While the New York Department of Environmental Conservation (NY DEC) does not currently conduct fishery-independent monitoring programs for Atlantic coastal sharks, multiple research permits were issued in 2020 for the collection of information on sand tiger sharks, blue sharks, sandbar sharks, shortfin mako sharks, dusky sharks, smooth hammerhead sharks, common thresher sharks, blacktip sharks, and white sharks by the Wildlife Conservation Society (WCS)/New York Aquarium; Stony Brook University; South Fork Natural History Museum; and the O’Seas Conservation Foundation. In 2020, WCS/New York Aquarium caught and released 5 sandbar sharks, 4 dusky sharks, 2 sand tiger sharks; Stony Brook University caught and sampled 8 sandbar sharks, 4 blue sharks, 3 dusky sharks, 2 sand tiger sharks, 1 white shark, 1 shortfin mako shark, 1 smooth hammerhead shark, and 1 blacktip shark; the South Fork Natural History Museum captured, tagged, and released 1 thresher shark, 1 dusky shark, 1 sandbar shark, and 1 white shark; the O’Seas Conservation Foundation collected and tagged 100 smooth dogfish sharks, 2 sandbar sharks, 1 spinner shark, 1 white shark, and 1 blue shark. Information on each shark (morphometrics and sex), as well location, date, biological samples collected, telemetry gear deployed, and final disposition of the animals were recorded.

New Jersey

New Jersey does not currently conduct any fishery-independent monitoring programs specifically for Atlantic coastal sharks, but does encounter sharks from the state’s Ocean Stock Assessment Survey. In 2020, the Survey caught less than 1lb. of smooth dogfish only and no other coastal sharks (Figures 5 and 6). This amount is far less than normal as the survey was stalled due to COVID safety restrictions.

Sharks sampled by the New Jersey Ocean Stock Assessment Survey are collected by a 30-meter otter trawl every January, April, June, August, and October since 1989. Tows are approximately

1 nautical mile and are performed via a stratified random sampling design. Latitudinal strata are identical to those used by the National Marine Fisheries Service groundfish survey. Longitudinal boundaries are defined by the 18-30, 30-60, and 60-90-foot isobaths. Smooth Dogfish are cumulatively weighed and measured by total length in centimeters. All other shark species are sorted by gender, weighed individually, and measured by total length in centimeters.

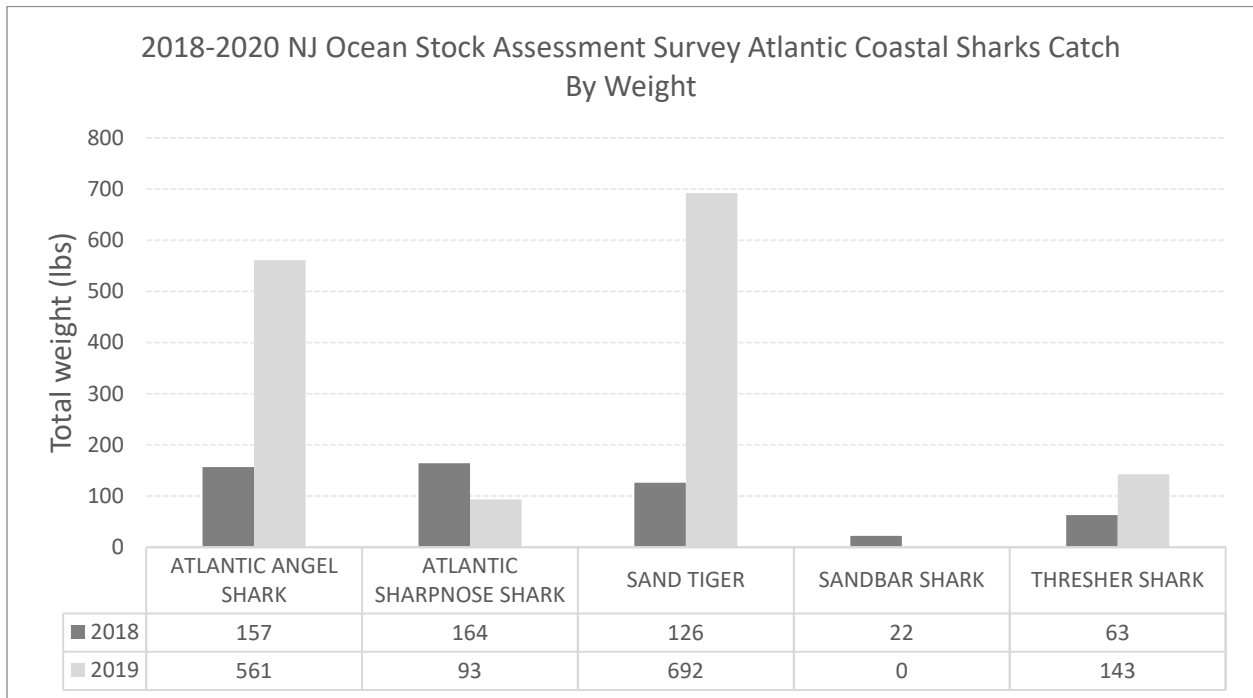


Figure 5. NJ 2018-2020 Ocean Stock Assessment Survey, Atlantic Coastal Sharks excluding Smooth Dogfish

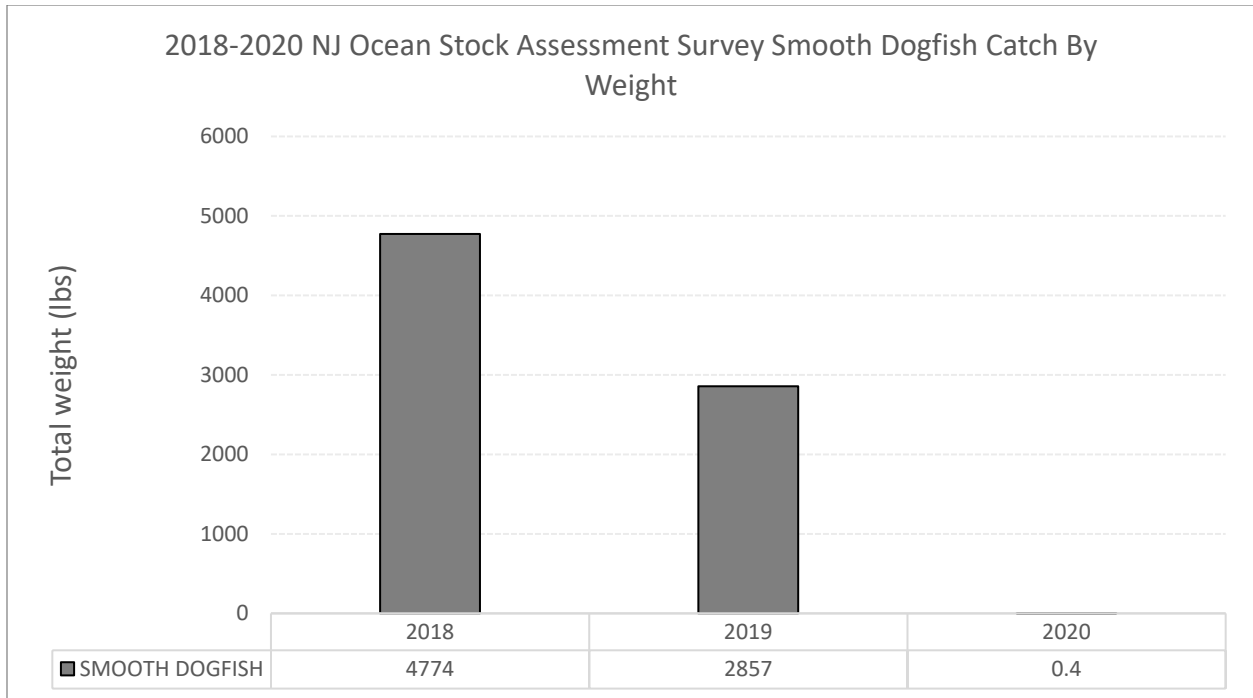


Figure 6. NJ 2018-2020 Ocean Stock Assessment Survey Atlantic, Smooth Dogfish

Delaware

Delaware conducts a 30' adult trawl survey and a 16' juvenile trawl survey in the Delaware Bay. In the adult trawl survey, smooth dogfish are the most common shark species caught (Figure 7), with sand tiger shark (Figure 8) and sandbar sharks (Figure 9) taken in low numbers. Thresher, Atlantic angel, Atlantic sharpnose (Figure 10) and dusky shark were caught in the past, but rarely. Sand tiger shark catch per nautical mile decreased in 2020 from a historical high in 2019. Sandbar shark catch per nautical mile increased in 2020 relative to 2019 and was at the seventh highest level of abundance for the time series. Smooth dogfish catch per nautical mile decreased in 2020 and is still relatively low compared to the early 2000's. In the juvenile trawl, the species caught include sand tiger shark (Figure 11), sandbar sharks (Figure 12) and smooth dogfish (Figure 13). Apart from smooth dogfish, the capture of coastal sharks in the juvenile trawl is a rare occurrence.

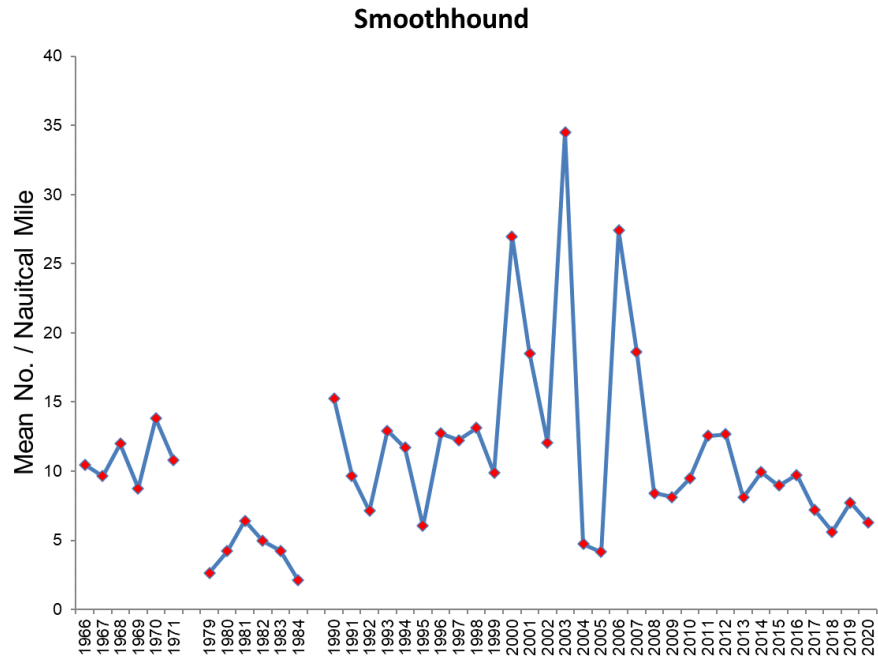


Figure 7. Smooth dogfish relative abundance (mean number per nautical mile), time series (1966 – 2020) as measured in 30-foot trawl sampling in the Delaware Bay.

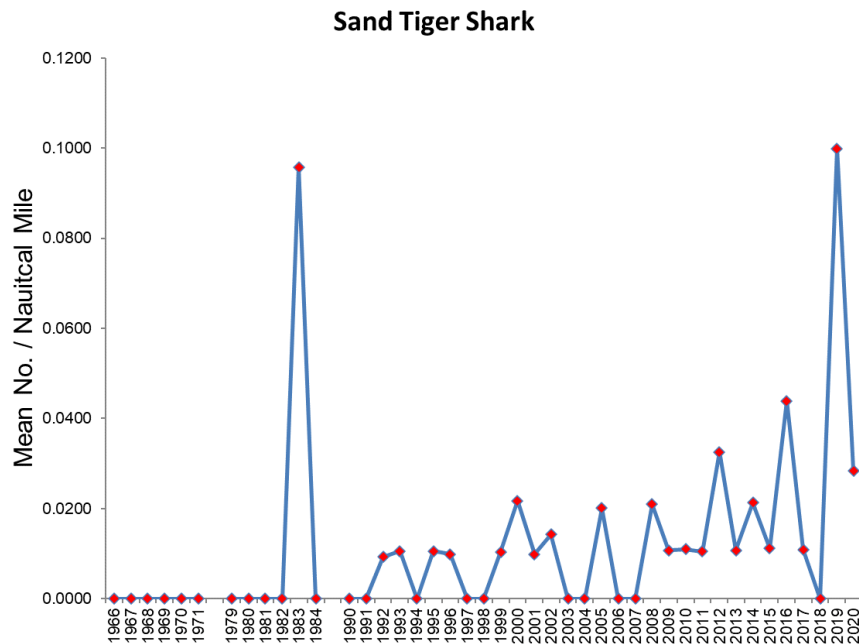


Figure 8. Sand tiger shark relative abundance (mean number per nautical mile), time series (1966 – 2020) as measured in 30-foot trawl sampling in the Delaware Bay.

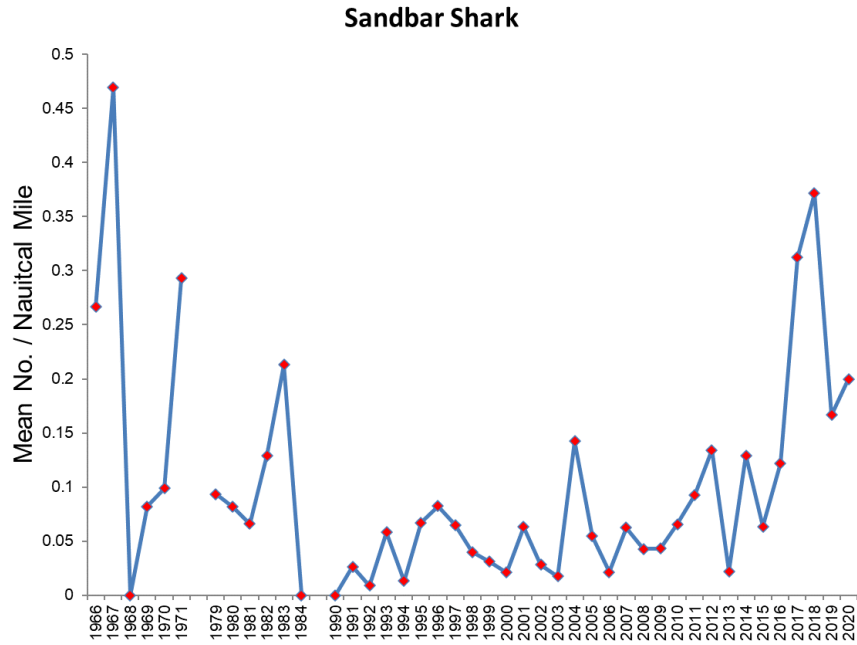


Figure 9. Sandbar shark relative abundance (mean number per nautical mile), time series (1966 – 2020) as measured in 30-foot trawl sampling in the Delaware Bay.

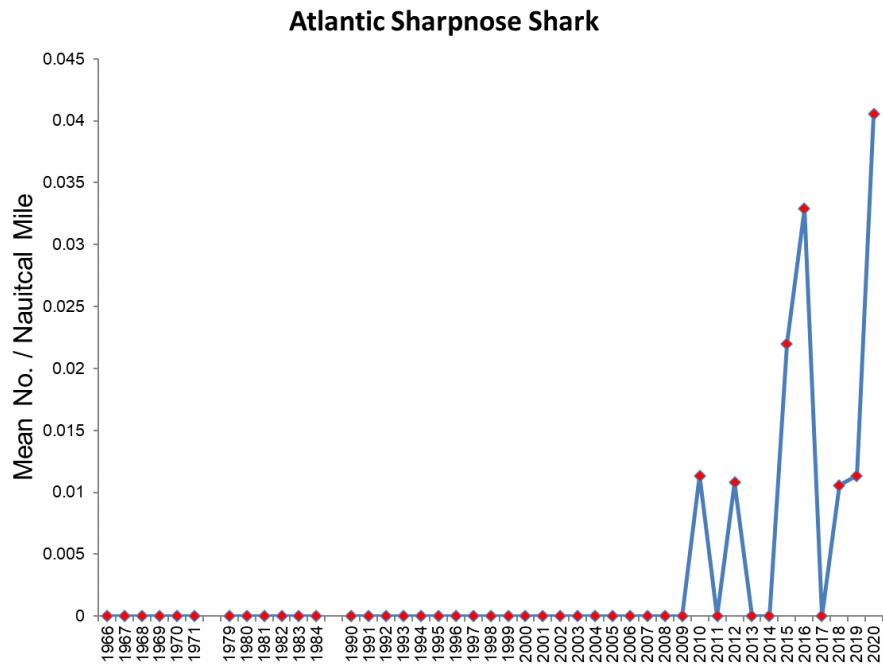


Figure 10. Atlantic sharpnose shark relative abundance (mean number per nautical mile), time series (1966 – 2020) as measured in 30-foot trawl sampling in the Delaware Bay.

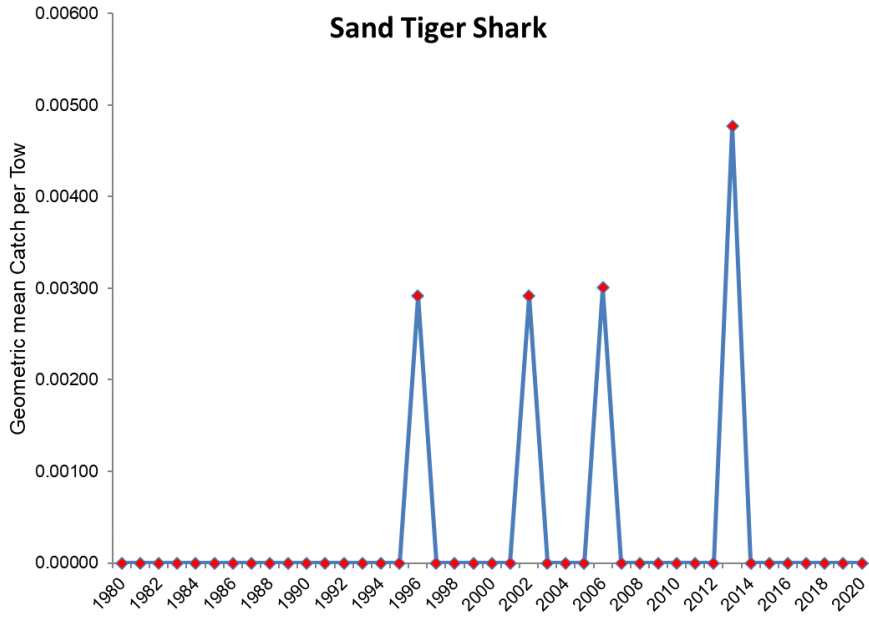


Figure 11. Index of sand tiger shark, time series (1980 – 2020) as measured by 16-foot trawl sampling in the Delaware Estuary.

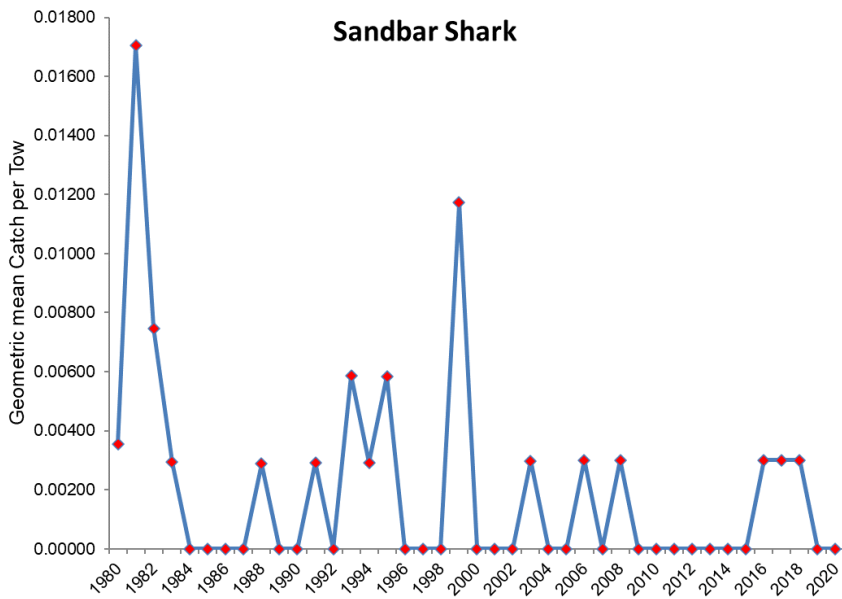


Figure 12. Index of sandbar shark, time series (1980 – 2020) as measured by 16-foot trawl sampling in the Delaware Estuary.

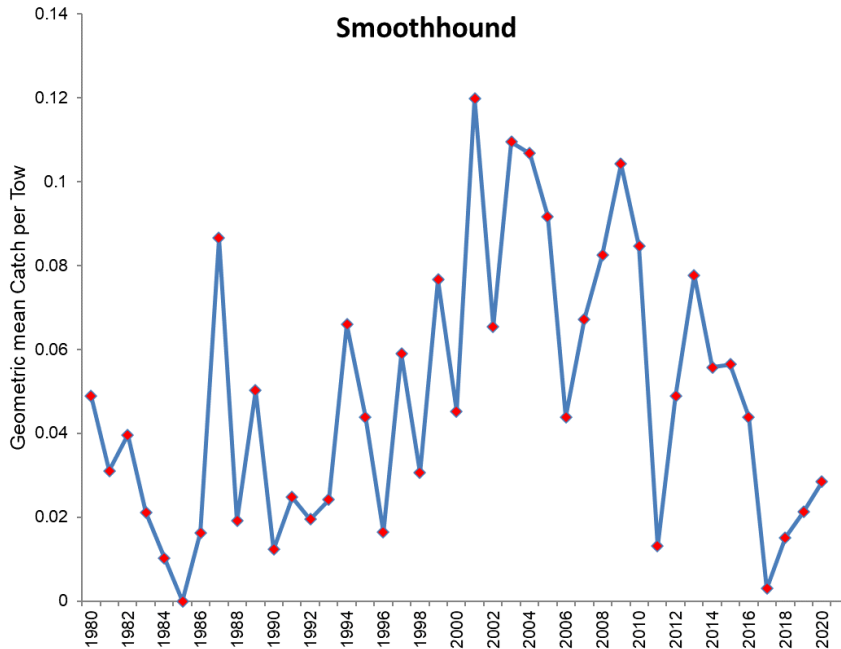


Figure 13. Index of young-of-year smooth dogfish abundance, time series (1980 – 2020) as measured by 16-foot trawl sampling in the Delaware Estuary.

Maryland

No fishery-independent monitoring for Atlantic coastal sharks was conducted in Maryland state waters.

Virginia

The Virginia Institute of Marine Science Shark Research Program began in 1973 and is one of the longest running longline surveys in the world. The program has provided data on habitat utilization, age, growth, reproduction, trophic interactions, basic demographics, and relative abundance for dominant shark species. Cruise times have been variable over the time series, but generally sampling has occurred monthly from May through October. The survey utilizes a fixed station design with nine core sampling locations, although additional auxiliary locations have been sampled frequently over the years.

Beginning in 2012, a separate longline survey conducted by the Virginia Institute of Marine Science designed specifically to target young-of-year sandbar sharks in the lower Chesapeake Bay and Eastern Shore was initiated. The new survey follows a stratified random sampling design, rather than a fixed survey design, and falls under the broader COASTSPAN umbrella survey.

In 2020, Atlantic sharpnose shark was the most commonly encountered species by the offshore survey followed by sandbar shark, blacktip shark, spinner shark, blacknose shark, sand tiger shark, tiger shark, bull shark, dusky shark, scalloped hammerhead, and silky shark (Table 1).

Seasonal patterns in survey catches were also evident with June and July showing higher overall catches of sharks when compared to August and September.

COASTSPAN catches of neonate sandbar shark (≤ 71 cm total length) were highest in magnitude during August in the lower Chesapeake Bay, followed by equal catch in June and July. In the coastal lagoons of the Eastern Shore, peak neonate catch occurred in August followed by July and June (Table 12). For 2020, neonate total catch was notably higher in the coastal lagoons of the Eastern Shore when compared to that of the lower Chesapeake Bay.

Table 11. Monthly catch summaries for key shark species encountered during offshore longline cruise conducted by VASMAP, 2020 pooled across the standard six sampling sites. Effort is expressed as total longline soak time of 100 hooks

Month	Effort (hrs)	Sand Tiger	Sandbar	Tiger	Atlantic Sharpnose	Spinner	Dusky	Blacknose	Blacktip	Scalloped Hammerhead	Bull	Silky
Jun	31.1	2	16	2	27	3	0	4	23	0	0	0
Jul	28.1	0	6	2	55	0	0	1	14	0	1	0
Aug	32.2	1	4	0	19	0	0	2	12	0	0	0
Sep	29.0	3	29	0	1	5	1	0	0	1	0	1
Total		6	55	4	102	8	1	7	49	1	1	1

	Blacktip	Scalloped Hammerhead	Bull	Silky
	23	0	0	0
	14	0	1	0
	12	0	0	0
	0	1	0	1
Total	49	1	1	1

Table 12. Neonate catch summaries for each monthly COASTSPAN cruise, 2020, pooled across the sampling sites with the lower Chesapeake Bay and coastal lagoons of the Eastern Shore. Effort is expressed as total longline soak time of 50 hooks.

Lower Chesapeake Bay

Month	Effort (hrs)	Neonate
Jun	10.0	35
Jul	10.0	35
Aug	10.0	44
Total		

Lagoons, Eastern Shore

Month	Effort (hrs)	Neonate
Jun	4.5	76
Jul	7.5	93
Aug	7.5	117
Total		

North Carolina

Fishery-Dependent

Fishery-dependent sampling of North Carolina commercial fisheries has been ongoing since 1982 (conducted under Title III of the Interjurisdictional Fisheries Act and funded in part by the U.S. Department of Commerce, National Marine Fisheries Service). Predominate fisheries sampled includes the ocean gill net, estuarine gill net, ocean trawl, long haul seine/swipe net, beach seine, and pound net fisheries. Fishery-dependent sampling did not occur from April to May 2020 due to COVID-19 concerns but resumed in June 2020. Shark species were sampled

from 57 commercial trips in 2020 with February having the highest number of sampled trips (Table 13). Seventy-one sharks comprised of six species were sampled (Table 14).

Table 13. North Carolina 2020 fishery-dependent shark sampling summary by month.

Month	Total Trips Sampled
January	7
February	15
March	7
April	0
May	0
June	12
July	4
August	1
September	1
October	6
November	2
December	2
Total	57

Table 14. North Carolina 2020 fishery-dependent shark sampling summary by species for total number of individuals and total sampled weight.

Shark Species	#Total Individuals	Weight (kg)
Atlantic Sharpnose	32	51
Blacktip	10	63
Bonnethead	1	3
Hammerhead	2	138
Smoothhound	28	35
Spinner	8	168

Total	71	458
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Fishery-Independent

The NCDMF has two fishery-independent surveys that collect coastal sharks: A gill net survey (Program 915) and a red drum long line survey (Program 365). Program 915 was initiated in 2001. The objective of this project is to provide annual relative abundance indices for key estuarine species in the near shore, Pamlico Sound, Pamlico, Pungo, Neuse, New, and Cape Fear rivers. The survey employs a stratified random sampling design and utilizes multiple mesh gill nets (3.0 inch to 6.5 inch stretched mesh, by 0.5 inch increments). Program 365 was initiated in 2007 for developing an index of abundance for adult red drum. This project also allows for capture and tagging of Atlantic coastal sharks in collaboration with the NOAA Fisheries Cooperative Shark Tagging Program.

For the 2020 sampling year, the red drum long line survey and the gill net survey did not occur due to the COVID pandemic. Executive Order (EO) 116, issued on March 10, 2020, declared North Carolina under a State of Emergency and was soon followed by EO 120 which implemented a statewide Stay at Home Order for all non-essential State employees.

South Carolina

Data related to the presence and movement of sharks in South Carolina’s coastal waters will continue to be collected as encountered within the context of existing fishery dependent or fishery independent programs conducted by the SCDNR. Currently, data are collected from estuarine waters by the SCDNR Cooperative Atlantic States Shark Pupping and Nursery Habitat survey (COASTSPAN) and the SCDNR trammel net survey. The COASTSPAN survey monitors the presence and abundance of young-of-year and juvenile sharks in the estuaries and bays of South Carolina. The survey operates from April-September using gillnets, longlines and drumlines to sample index stations. Species captured are measured, sexed, tagged and released, and physical and water quality parameters are recorded (Table 15).

The SCDNR trammel net survey is designed to sample recreationally important species in shallow estuarine waters. Sharks are not a target species, but their abundance as well as length and sex data are recorded (Table 15). Stations selected based on suitable habitats are randomly sampled using a multi-panel net to encircle a section of marsh. Species captured are measured, sexed if possible, and released. In addition, physical and water quality data are recorded for each sample location.

The presence and abundance of juvenile and adult coastal sharks in the bays, sounds and coastal waters of South Carolina are documented by the Coastal Longline Survey. This survey uses a stratified-random approach to sample for adult red drum and coastal sharks. The survey operates annually from August to December using longlines to sample suitable habitat for targeted species. Species captured are measured, sexed, tagged, and released, and physical and

water quality parameters are recorded. Species encountered and tagged for all surveys are reported in Table 15. The data gathered from these programs are shared with the NMFS Apex Predators Program and are utilized in stock assessments and management decisions in South Carolina.

Table 15. Number of sharks captured and tagged by South Carolina Department of Natural Resources' Cooperative Atlantic States Shark Pupping and Nursery Habitat Survey (COASTSPAN), Trammel Net Survey, and Coastal Longline survey in 2020.

Shark Species	COASTSPAN		Trammel Net		Coastal Longline Survey	
	Captured	Tagged	Captured	Tagged	Captured	Tagged
Atlantic Sharpnose	65	0	6	0	1007	0
Blacknose	0	0	0	0	130	125
Blacktip	249	93	11	0	54	42
Bonnethead	189	126	97	0	65	65
Bull	7	6	0	0	3	3
Dusky	0	0	0	0	0	0
Finetooth	351	47	18	0	78	72
Great Hammerhead	0	0	0	0	2	1
Lemon	13	9	7	0	5	1
Nurse	0	0	0	0	1	1
Sandbar	215	196	4	0	195	166
Sand Tiger	0	0	0	0	0	0
Scalloped/Carolina Hammerhead	201	17	0	0	6	3
Smooth Dogfish	0	0	0	0	0	0
Spinner	0	0	0	0	33	28
Tiger	0	0	0	0	1	0

Georgia

Fishery-Dependent

Although a directed fishery for sharks does not exist in Georgia waters, there is a fishery-dependent sampling project conducted by the Coastal Resources Division (CRD) that can result in the incidental capture of coastal sharks. The Marine Sportfish Carcass Recovery Project, a partnership with recreational anglers along the Georgia coast, is used to collect biological data from finfish such as Red Drum, Spotted Seatrout, Southern Flounder, Sheepshead, and Southern Kingfish. Participating anglers deposit fish carcasses in chest freezers located at public access points along the Georgia coast. In 2020, a total of 5,037 fish carcasses were donated through this program. No coastal shark species were included.

Fishery-Independent

Georgia has several fishery-independent surveys that sample in areas where coastal shark species are encountered and one survey specifically designed to sample sub-adult sharks in Georgia's inshore waters.

Coastal Longline Survey (SEAMAP)

The Coastal Longline Survey is designed to sample adult Red Drum and coastal sharks. Sampling occurs in inshore and nearshore waters of southeast Georgia from mid-June through mid-December. Sampling gear consists of a bottom set 926 m, 600 lb. test monofilament mainline configured with 60, 0.5 m gangions made of 200 lb. test monofilament. Each gangion consists of a longline snap and a 15/0 circle hook. Thirty hooks were baited with squid, and thirty were baited with mullet. Soak time for each set is 30 minutes. During 2020, CRD staff deployed 54 sets consisting of 3,236 hooks and 27 hours of soak time. A total of 253 sharks were captured, representing ten species (Table 16).

Shark Nursery Survey (COASTSPAN)

The University of North Florida assumed field operations for this survey in 2016. Data for the complete time series are maintained by the NMFS Apex Predators Program in Narragansett, RI (contact: Cami McCandless).

Ecological Monitoring Trawl Survey (EMTS)

The EMTS is designed to sample penaeid shrimp, blue crab, and other marine organisms typically encountered in the trawl for management and monitoring purposes. Each month, a 40 ft flat otter trawl with neither a turtle excluder device nor bycatch reduction device is deployed at 36 stations across six estuaries. At each station, a standard 15-minute tow is made. During this report period, 336 tows/observations were conducted, totaling 84.29 hours of tow time. A total of 85 sharks, representing 5 species, were captured during 2020 (Table 16).

Marine Sportfish Population Health Survey (MSPHS)

The MSPFIS is a multi-faceted ongoing survey used to collect information on the biology and population dynamics of recreationally important finfish. The Altamaha River System and the Wassaw Estuary has been sampled since 2003 using entanglement gear. The St. Andrew Estuary was added in 2019.

During the June to August period, young-of-the-year Red Drum in the Altamaha River System and Wassaw and St. Andrew estuaries are collected using gillnets to gather data on relative abundance and location of occurrence. During the September to November period, fish populations in the Altamaha River System and Wassaw Estuary are monitored using monofilament trammel nets to gather data on relative abundance and size composition. In 2020, a total of 320 gillnet and 225 trammel net sets were made, resulting in the capture of 415 individuals representing 6 species of coastal sharks (Table 16).

Table 16. Numbers of coastal sharks captured in Georgia fishery-independent surveys in 2020 by species and by survey.

	SEAMAP	EMTS	MSPHS
SHARK, ATLANTIC SHARPNOSE	131	29	122
SHARK, BLACKNOSE	55	---	---
SHARK, BLACKTIP	22	2	16
SHARK, BONNETHEAD	23	49	245
SHARK, BULL	---	---	---
SHARK, FINETOOTH	6	---	5
SHARK, LEMON	---	---	4
SHARK, SANDBAR	11	2	---
SHARK, SCALLOPED HAMMERHEAD	2	3	---
SHARK, SPINNER	2	---	23
SHARK, TIGER	1	---	---
ALL SPECIES COMBINED	253	85	415

Florida

Florida Fish and Wildlife Conservation Commission had no fisheries-independent monitoring programs for coastal sharks during the 2020 calendar year.

V. Status of Management Measures and Issues

Fishery Management Plan

Coastal Sharks are managed under the Interstate FMP for Coastal Sharks, which was adopted in August 2008 and effective in January 1, 2009, Addendum I (2009), Addendum II (2013), Addendum III (2013), Addendum IV (2016), and Addendum V (2018). The FMP addresses the management of 41 species and establishes a suite of management measures for recreational and commercial shark fisheries in state waters (0 – 3 miles from shore). Addendum V provided the Board the ability to respond to changes in the stock status of coastal shark populations and adjust regulations through Board action rather than an addendum, ensuring greater consistency between state and federal shark regulations.

In April 2019, the Board approved changes to the recreational size limit for Atlantic shortfin mako sharks in state waters, specifically, a 71-inch straight line fork length (FL) for males and an 83-inch straight line FL for females. These measures are consistent with those required for federal highly migratory species (HMS) permit holders under HMS Amendment 11, which was implemented in response to the 2017 Atlantic shortfin mako stock assessment that found the resource is overfished and experiencing overfishing.

In October 2019, the Board approved changes to the gear requirements for recreational shark fishing. For recreational shark fishing in state waters, anglers are required to use non-offset, corrodible, non-stainless steel circle hooks, except when fishing with flies or artificial lures. This measure has been in effect since July 1, 2020 and are intended to promote consistency with those approved through HMS Amendment 11.

ASMFC will continue to respond to changes in the Atlantic Highly Migratory Species FMP and make changes as necessary to the interstate FMP.

VI. Implementation of FMP Compliance Requirements for 2020

Addendum III to the Coastal Sharks FMP was implemented in March 2014, which modified the recreational minimum size limits and the commercial species groupings in the FMP. In 2019, the Board also adjusted the recreational minimum size for shortfin mako and approved the requirement for non-offset, corrodible, non-stainless steel circle hooks, except when fishing with flies or artificial lures. All states must demonstrate through the inclusion of regulatory language that the following management measures were implemented.

i. Recreational Minimum Size Limits

This modifies Section 4.2.4 Recreational Minimum Size Limits in the FMP.

Sharks caught in the recreational fishery must have a minimum fork length of 4.5 feet (54 inches) with the exception of smooth hammerhead, scalloped hammerhead, great hammerhead, shortfin mako, smoothhound, Atlantic sharpnose, blacknose, finetooth, and bonnethead sharks.

Smooth hammerhead, scalloped hammerhead and great hammerhead sharks must have a minimum fork length of 6.5 feet (78 inches). Male Shortfin mako sharks must have a minimum fork length of 71 inches and females must have a minimum fork length of 83 inches.

Smoothhound, Atlantic sharpnose, blacknose, finetooth and bonnethead sharks do not have recreational minimum size limits.

Table 17 Recreational minimum size limits, 2020.

No Minimum Size	Minimum Fork Length 54 inches		Minimum Fork Length 71/83 inches	Minimum Fork Length 78 inches
Smoothhound	Tiger	Nurse	Shortfin mako (male/female)	Great hammerhead
Atlantic sharpnose	Blacktip	Porbeagle		Scalloped hammerhead
Finetooth	Spinner	Thresher		Smooth hammerhead
Blacknose	Bull	Oceanic whitetip		
Bonnethead	Lemon	Blue		

ii. Commercial Species Groupings

This modifies Section 4.3.3 Commercial Species Groupings (and the appropriate sub-sections, outlined below). Two new species groups ('Blacknose' and 'Hammerhead') are created.

This FMP establishes eight commercial 'species groups' for management (Table 1): Prohibited, Research, Smoothhound, Non-Blacknose Small Coastal, Blacknose, Aggregated Large Coastal, Hammerhead, and Pelagic. These groupings apply to all commercial shark fisheries in state waters.

VII. PRT Recommendations

State Compliance

- New Jersey's rulemaking process has delayed implementation of the non-offset stainless steel circle hooks until January 2023. The PRT expressed some concern regarding the delay and the potential biological impacts the delayed regulation may have due to increased post-release mortality of sharks. Even after a rule is implemented, education and outreach efforts are needed to increase compliance, which further lengthens the timeline of full implementation.
- Georgia's compliance report doesn't provide any regulations regarding the variable possession limits for the aggregated large coastal and hammerhead management groups. However, Georgia limits commercial fishermen to the same daily creel and size limits that the recreational sector is subject to, and no commercial landings occurred in 2020.
- Georgia's recreational regulations allows for the landing of 1 hammerhead, 1 shortfin mako, and 1 "other" shark, which is in excess of what is allowed under the FMP (1 shark

per person/vessel plus one Atlantic sharpnose and one bonnethead). This issue has been raised with Georgia Department of Natural Resources staff and Commission staff is awaiting a response.

- With the three exceptions noted above, the PRT determined that all states have implemented regulations consistent with the FMP requirements.

General Comments

- It has come to the attention of the PRT that some states have been requiring individuals and organizations request for federal approval for the scientific capture of sharks in state waters. While it is an FMP requirement that the scientific capture of sharks be monitored and permitted by each state, it is not a requirement that federal approval be given if the capture occurs within state waters.

De Minimis Status

This FMP does not establish specific *de minimis* guidelines that would exempt a state from regulatory requirements contained in this plan. *De minimis* shall be determined on a case-by-case basis. *De minimis* often exempts states from monitoring requirements in other fisheries but this plan does not contain any monitoring requirements.

De minimis guidelines are established in other fisheries when implementation and enforcement of a regulation is deemed unnecessary for attainment of the fishery management plan's objectives and conservation of the resource. Due to the unique characteristics of the coastal shark fishery, namely the large size of sharks compared to relatively small quotas, the taking of a single shark could contribute to overfishing of a shark species or group. Therefore, exempting a state from any of the regulatory requirements contained in this plan could threaten attainment of this plans' goals and objectives.

Massachusetts is the only state that has been granted *de minimis* status. Massachusetts can continue to have *de minimis* status until their landings patterns change or they request a discontinuation.

In some cases, it is unnecessary for states with *de minimis* status to implement all regulatory requirements in the FMP.

- A. Massachusetts has implemented all regulations with two exceptions: it is exempt from the possession limit and closures of the aggregated large coastal and hammerhead shark fisheries.

VIII. Research Recommendations

Research recommendations were identified in 2018 in the Commission's [Fisheries Research Priorities document](#) (p. 42).

References

Hayes, C.G., Jiao, Y., Cortés, E. 2009. Stock assessment of scalloped hammerheads in the western North Atlantic Ocean and Gulf of Mexico. *North American Journal of Fisheries Management*. 29(5): 1406-1417

Stock Assessment and Fishery Evaluation (SAFE) Report for Atlantic Highly Migratory Species. 2021. NOAA Fisheries, April 1, 2022.

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Research Priorities and Recommendations to Support Interjurisdictional Fisheries Management. 2018. ASMFC, April 7, 2022.

< http://www.asmfc.org/files/pub/ResearchPriorities_April2018.pdf >

Quattro, J.M., Driggers, W.B.I., Grady, J.M., Ulrich, G.F., Roberts, M.A. 2013. *Sphyrna gilberti* sp. nov., a new hammerhead shark (Carcharhiniformes, Sphyrnidae) from the western Atlantic Ocean. *Zootaxa*. 3702(2): 159-178.

APPENDIX 1. OVERVIEW OF COASTAL SHARK REGULATIONS

Coastal Sharks FMP Regulatory Requirements

1. Recreational seasonal closure (Section 4.2.1)
 - a. Recreational anglers are prohibited from possessing silky, tiger, blacktip, spinner, bull, lemon, nurse, scalloped hammerhead, great hammerhead, and smooth hammerhead in the state waters of Virginia, Maryland, Delaware and New Jersey from May 15 through July 15—regardless of where the shark was caught.
 - b. Recreational fishermen who catch any of these species in federal waters may not transport them through the state waters of VA, MD, DE, and NJ during the seasonal closure.
2. Recreationally permitted species (Section 4.2.2)
 - a. Recreational anglers are allowed to possess aggregated large coastal sharks, hammerheads, tiger sharks, SCS, and pelagic sharks. Authorized shark species include: aggregated LCS (blacktip, bull, spinner, lemon, and nurse); hammerhead (great hammerhead, smooth hammerhead, scalloped hammerhead); tiger sharks; SCS (blacknose, finetooth, Atlantic sharpnose, and bonnethead sharks); and, pelagic sharks (blue, shortfin mako, common thresher, oceanic whitetip, and porbeagle). Sandbar sharks and silky sharks (and all prohibited species of sharks) are not authorized for harvest by recreational anglers.
3. Landings Requirements (Section 4.2.3)
 - a. All sharks (with exception) caught by recreational fishermen must have heads, tails, and fins attached naturally to the carcass. Anglers may still gut and bleed the carcass by making an incision at the base of the caudal peduncle as long as the tail is not removed. Filleting sharks at sea is prohibited.
 - b. All sharks (with exception) harvested by commercial fishermen within state boundaries must have the tails and fins attached naturally to the carcass through landing. Fins may be cut as long as they remain attached to the carcass (by natural means) with at least a small portion of uncut skin. Sharks may be eviscerated and have the heads removed. Sharks may not be filleted or cut into pieces at sea.
 - c. Exception: Fishermen holding a valid state commercial permit may process smooth dogfish sharks at sea out to 50 miles from shore, as long as the total weight of smooth dogfish shark fins landed or found on board a vessel does not exceed 12 percent of the total weight of smooth dogfish shark carcasses landed or found on board.
4. Recreational Minimum Size Limits (Section 4.2.4)
 - a. Sharks caught in the recreational fishery must have a fork length of at least 4.5 feet (54 inches) with the exception of Atlantic sharpnose, blacknose, finetooth,

bonnethead and smoothhound which have no minimum size. Hammerhead species must have a fork length (FL) of 6.5 feet (78 inches).

- b. Recreational size limit for Atlantic shortfin mako sharks in state waters is 71-inch straight line FL for males and 83-inch straight light FL for females.

5. Authorized Recreational Gear (Section 4.2.5)

- a. Recreational anglers may catch sharks only using a handline or rod & reel. Handlines are defined as a mainline to which no more than two gangions or hooks are attached. A handline must be retrieved by hand, not by mechanical means.
- b. Non-offset, corrodible, non-stainless steel circle hooks are required when fishing for sharks recreationally, in state waters. The only exception is when fishing with flies or artificial lures

6. Possession limits in one twenty-four hour period (Section 4.2.7 and 4.3.6)

- a. Recreational and commercial possession limits as specified in Table 9.
- b. Smooth dogfish harvest is not limited in state waters and recreational shore-anglers may harvest an unlimited amount of smooth dogfish.

7. Commercial Seasonal Closure (Section 4.3.2)

- a. All commercial fishermen are prohibited from possessing silky, tiger, blacktip, spinner, bull, lemon, nurse, scalloped hammerhead, great hammerhead, and smooth hammerhead in the state waters of Virginia, Maryland, Delaware and New Jersey from May 15 through July 15. Fishermen who catch any of the above species in a legal manner in federal waters may transit through the state waters listed above if all gear is stowed.

8. Quota Specification (Section 4.3.4)

- a. When NOAA Fisheries closes the fishery for any species, the commercial landing, harvest, and possession of that species will be prohibited in state waters until NOAA Fisheries reopens the fishery.

9. Permit requirements (Section 4.3.8)

- a. State: Commercial shark fishermen must hold a state commercial license or permit in order to commercially catch and sell sharks in state waters.
- b. Federal: A federal Commercial Shark Dealer Permit is required to buy and sell any shark caught in state waters.
- c. Display and research permit is required to be exempt from seasonal closure, quota, possession limit, size limit, gear, and prohibited species restrictions. States are required to include annual information for all sharks taken for display throughout the life of the shark.

10. Authorized commercial gear (Section 4.3.8.3)

- a. Commercial fishermen can only use one of the following gear types (and are prohibited from using any gear type not listed below) to catch sharks in state waters.
 - i. **Rod & reel.**
 - ii. **Handlines.** Handlines are defined as a mainline to which no more than two gangions or hooks are attached. A handline is retrieved by hand, not by mechanical means, and must be attached to, or in contact with, a vessel.
 - iii. **Small Mesh Gillnets.** Defined as having a stretch mesh size smaller than 5 inches.
 - iv. **Large Mesh Gillnets.** Defined as having a stretch mesh size equal to or greater than 5 inches.
 - v. **Trawl nets.**
 - vi. **Shortlines.** Shortlines are defined as fishing lines containing 50 or fewer hooks and measuring less than 500 yards in length. A maximum of 2 shortlines are allowed per vessel.
 - vii. **Pounds nets/fish traps.**
 - viii. **Weirs.**

11. Bycatch Reduction Measures (Section 4.3.10)

- a. Any vessel using a shortline must use corrodible circle hooks. All shortline vessels must practice the protocols and possess the recently updated federally required release equipment for pelagic and bottom longlines for the safe handling, release, and disentanglement of sea turtles and other non-target species, all captains and vessel owners must be certified in using handling and release equipment.

12. Smooth Dogfish

- a. Each state must identify their percentage of the overall quota (Addendum II, 3.1)
- b. Smooth dogfish must make up at least 25%, by weight, of total catch on board at time of landing. Trips that do not meet the 25% catch composition requirement can land smooth dogfish, but fins must remain naturally attached to the carcass (Addendum IV, 3.0; modifies Addendum II Section 3.5).

Table 18. Possession/retention limits for shark species in state waters

Recreational	<i>Shore-angler</i>	1 shark (of any species except prohibited) per person per day; plus one Atlantic sharpnose, and one bonnethead. No limit on smoothhound
	<i>Vessel-fishing</i>	1 shark (of any species except prohibited) per vessel per trip; plus one Atlantic sharpnose, and one bonnethead per person per vessel. No limit on smoothhound

Commercial	<i>Directed permit</i>	Variable possession limit for aggregated large coastal sharks and hammerhead shark management groups. The Commission will follow NMFS for in-season changes to the possession limit. The possession limit range is 0-55, the default is 45 sharks per trip. No limit for SCS or pelagic sharks.
	<i>Incidental permit</i>	3 aggregated LCS per vessel per trip and 16 pelagic or SCS (combined) per vessel per trip

Atlantic States Marine Fisheries Commission

Atlantic Menhaden Management Board

November 9, 2022

1:30 – 5:30 p.m.

Hybrid Meeting

Draft Agenda

The times listed are approximate; the order in which these items will be taken is subject to change; other items may be added as necessary.

This meeting will include a 10-minute break.

- | | |
|--|-----------|
| 1. Welcome/Call to Order (<i>M. Bell</i>) | 1:30 p.m. |
| 2. Board Consent | 1:30 p.m. |
| • Approval of Agenda | |
| • Approval of Proceedings from August 2022 | |
| 3. Public Comment | 1:35 p.m. |
| 4. Consider Addendum I to Amendment 3 on Commercial Allocations, Episodic Event Set Aside Program, and Incidental Catch/Small-scale Fisheries for Final Approval Final Action | 1:45 p.m. |
| • Review Public Comment Summary (<i>J. Boyle</i>) | |
| • Review Advisory Panel Report (<i>M. Lapp</i>) | |
| • Consider Final Approval of Addendum I | |
| 5. Set 2023 Specifications Final Action | 4:00 p.m. |
| • Review Technical Committee Report of Stock Projections (<i>J. Newhard</i>) | |
| 6. Other Business/Adjourn | 5:30 p.m. |

The meeting will be held at The Ocean Place Resort (1 Ocean Boulevard, Long Branch, NJ; 732.571.4000) and via webinar; click [here](#) for details

Atlantic States Marine Fisheries Commission

MEETING OVERVIEW

Atlantic Menhaden Management Board

Wednesday, November 9, 2022

1:30 p.m. – 5:30 p.m.

Hybrid Meeting

Chair: Mel Bell (SC) Assumed Chairmanship: 10/21	Technical Committee Chair: Josh Newhard (USFWS)	Law Enforcement Committee Representative: Scott Simmons (MD)
Vice Chair: Conor McManus (RI)	Advisory Panel Chair: Meghan Lapp (RI)	Previous Board Meeting: August 3, 2022
Voting Members: ME, NH, MA, RI, CT, NY, NJ, PA, DE, MD, PRFC, VA, NC, SC, GA, FL, NMFS, USFWS (18 votes)		

2. Board Consent

- Approval of Agenda
- Approval of Proceedings from August 3, 2022

3. Public Comment – At the beginning of the meeting public comment will be taken on items not on the agenda. Individuals that wish to speak at this time should use the webinar raise your hand function and the Board Chair will let you know when to speak. For agenda items that have already gone out for public hearing and/or have had a public comment period that has closed, the Board Chair may determine that additional public comment will not provide additional information. In this circumstance, the Board Chair will not allow additional public comment on an issue. For agenda items that the public has not had a chance to provide input, the Board Chair may allow limited opportunity for comment. The Board Chair has the discretion to limit the number of speakers and/or the length of each comment.

4. Consider Addendum I to Amendment 3: *Commercial Allocations, Episodic Event Set Aside Program, and Incidental Catch/Small-scale Fisheries for Final Approval (1:45-4:00 p.m.) Final Action*

Background

- In August 2021, the Board initiated a draft addendum to consider changes to commercial allocations, the episodic event set aside (EESA) program, and the incidental catch and small-scale fisheries provision (IC/SSF) based on the Board work group report.
- The Board approved Draft Addendum I for public comment in August 2022. Public hearings were held for ME, NH, MA, RI, NY, NJ, DE-MD-PRFC, VA, and NC (**Briefing Materials**).
- The Advisory Panel met via webinar on October 18th to provide recommendations regarding Addendum I (**Supplemental Materials**).

Presentations

- Overview of options and public comment summary by J. Boyle
- Advisory Panel Report by M. Lapp
- Select management options and implementation dates

Atlantic States Marine Fisheries Commission

- Approve final document

5. 2023 Menhaden Specifications (4:00–5:30 p.m.) Final Action

Background

- The Board sets an annual or multi-year TAC using the best available science.
- The TC completed projection runs for the 2023-2025 years based on recommendations from the Board (**Briefing Materials**).

Presentations

- Review of 2023-2025 stock projections by J. Newhard

8. Other Business/Adjourn

Atlantic Menhaden

Activity level: High

Committee Overlap Score: High (SAS, ERP WG overlaps with American eel, striped bass, northern shrimp, Atlantic herring, horseshoe crab, weakfish)

Committee Task List

- TC – August 1st: Annual compliance reports due

TC Members: Josh Newhard (USFWS, Chair), Holly White (NC), Keilin Gamboa-Salazar (SC), Jason McNamee (RI), Eddie Leonard (GA), Jeff Brust (NJ), Matt Cieri (ME), Ingrid Braun (PRFC), Micah Dean (MA), Kurt Gottschall (CT), Caitlin Craig (NY, Vice-Chair), Shanna Madsen (VMRC), Chris Swanson (FL), Ray Mroch (NMFS), Amy Schueller (NMFS), Alexei Sharov (MD), Garry Glanden (DE), Heather Walsh (USGS), Kristen Anstead (ASMFC), James Boyle (ASMFC)

SAS Members: Amy Schueller (NMFS, SAS Chair), Matt Cieri (ME), Micah Dean (MA), Robert Latour (VIMS), Chris Swanson (FL), Ray Mroch (NMFS), Jason McNamee (RI), Alexei Sharov (MD), Jeff Brust (NJ) Kristen Anstead (ASMFC), James Boyle (ASMFC), Joey Ballenger (SC)

ERP WG Members: Jason Boucher (NOAA), Matt Cieri (ME,ERP Chair), Michael Celestino (NJ), David Chagaris (FL), Micah Dean (MA), Rob Latour (VIMS), Jason McNamee (RI), Amy Schueller (NFMS), Alexei Sharov (MD), Howard Townsend (NFMS), Jim Uphoff (MD), Kristen Anstead (ASMFC), Katie Drew (ASMFC), Sarah Murray (ASMFC)

**DRAFT PROCEEDINGS OF THE
ATLANTIC STATES MARINE FISHERIES COMMISSION
ATLANTIC MENHADEN MANAGEMENT BOARD**

**The Westin Crystal City
Arlington, Virginia**

August 3, 2022

Draft Proceedings of the Atlantic Menhaden Management Board Meeting
August 2022

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Adjournment 31

These minutes are draft and subject to approval by the Atlantic Menhaden Management Board.
The Board will review the minutes during its next meeting

INDEX OF MOTIONS

1. **Move to approve agenda** by Consent (Page 1).
2. **Move to approve proceedings of May 3, 2022** by Consent (Page 1).
3. **Move to approve Fishery Management Plan Review, state compliance reports, and *de minimis* requests for PA, SC, GA, and FL for Atlantic menhaden for the 2021 fishing year** (Page 16). Motion by John Clark; second by Pat Geer. Motion carried (Page 17).
4. **Move to remove *Option 3B: Weighted Allocation Timeframe #2* from Section 3.1.2. in Draft Addendum I** (Page 19). Motion by Cheri Patterson; second by Kris Kuhn. Motion carried (11 in favor, 5 opposed, 2 abstentions (Page 20).
5. **Move to modify section 3.3.2 option 3 by adding “existing beach seine fisheries”** (Page 27). Motion by Jim Gilmore; second by Joe Cimino. Motion fails for lack of a majority (1 in favor, 14 opposed, 1 null) (Page 30).
6. **Move to approve Draft Addendum I for Public Comment, as amended today** (Page 30). Motion by Megan Ware; second Cheri Patterson. Motion carried with one objection (NY) (Page 31).
7. **Move to approve the nomination of Barbara Garrity-Blake from NC to the Atlantic Menhaden Advisory Panel** (Page 31). Motion by Chris Batsavage; second by Pat Geer. Motion carried (Page 31).
8. **Motion to adjourn** by consent (Page 31).

Draft Proceedings of the Atlantic Menhaden Management Board Meeting
August 2022

ATTENDANCE

Board Members

Megan Ware, ME, proxy for Pat Keliher (AA)	John Clark, DE (AA)
Cheri Patterson, NH (AA)	Roy Miller, DE (GA)
Ritchie White, NH (GA)	Craig Pugh, DE, proxy for Rep. Carson (LA)
Dennis Abbott, NH, proxy for Sen. Watters (LA)	Lynn Fegley, MD, Administrative proxy
Nichola Meserve, MA	Russell Dize, MD (GA)
Raymond Kane, MA (GA)	Allison Colden, MD, proxy for Del. Stein (LA)
Sarah Ferrara, MA, proxy for Rep. Peake (LA)	Pat Geer, VA, proxy for J. Green (AA)
David Borden, RI (GA)	Bryan Plumlee, VA (GA)
Eric Reid, RI, proxy for Sen. Sosnowski (LA)	Chris Batsavage, NC, proxy for K. Rawls (AA)
Justin Davis, RI (AA)	Jerry Mannen, NC (GA)
Bill Hyatt, CT (GA)	Malcolm Rhodes, SC (GA)
Jim Gilmore, NY (AA)	Chris McDonough, SC, proxy for Sen. Cromer (LA)
Emerson Hasbrouck, NY (GA)	Doug Haymans, GA (AA)
Joe Cimino, NJ (AA)	Erika Burgess, FL, proxy for J. McCawley (AA)
Tom Fote, NJ (GA)	Gary Jennings, FL (GA)
Kris Kuhn, PA, proxy for T. Schaeffer (AA)	Marty Gary, PRFC
Loren Lustig, PA (GA)	Max Appelman, NMFS
G. Warren Elliott, PA (LA)	John Coll, USFWS

(AA = Administrative Appointee; GA = Governor Appointee; LA = Legislative Appointee)

Ex-Officio Members

Joshua Newhard, Technical Committee Chair

Staff

Bob Beal	Lisa Havel
Toni Kerns	Chris Jacobs
Lisa Carty	Jeff Kipp
Tina Berger	Geoff White
Pat Campfield	

Guests

Steve Atkinson	Thomas Burkett	Nicole Costa, RI DMF
Pat Augustine, Coram, NY	Diane Bynum	Heather Corbett, NJ DEP
Gerald Ault, Univ Miami	Will Caldwell	Robert Crockett
Rachel Barrales, Cape Cod CFA	Debbie Campbell	Monty Deihl, Ocean Fleet Svcs.
Rob Beal, ME DMR	Nicole Caudell, MD DNR	Greg DiDomenico, Lund's
John Bello	Mike Celestino, NJ DEP	Fisheries
Alan Bianchi, NC DENR	Benson Chiles, Chiles Consulting	John Duane
Ingrid Braun, PRFC	Matt Cieri, ME DMR	Paul Eidman
Jeff Brust, NJ DEP	John Cooke, Saving Seafood	Al Erskine
Al Erskine	David Fuller, Kelley Drye	Shaun Gehan, Gehan Law

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Guests (continued)

Angela Giuliano, MD DNR	Shanna Madsen, VMRC	Mike Ruccio, NOAA
Lewis Gillingham, VMRC	Joshua McGilly, VMRC	Eric Schneider, RI DEM
Brendan Harrison, NJ DEP	Dan McKiernan, MA (AA)	Somers Smott, VMRC
Marin Hawk, MSC	Jason McNamee, RI (AA)	Rene St. Amand, CT DEP
Helen Takade-Heumacher, EDF	Kevin McMenamin	David Stormer, DE DFW
Amanda Higgs, NYS DEC	Christi Medice	John Sweka, US FWS
Jaclyn Higgins, TRCP	John Maniscalco, NYS DEC	Christina Vaeth
Peter Himchak, Omega Protein	Steve Meyers, Williamsburg, VA	Bob Vanasse
Kyle Hoffman, SC DNR	Mike Millard	Scott Curatolo-Wagermann, Cornell Univ
Harry Hornick, MD DNR	Chris Moore, CBF	Mike Waive, ASA
Jesse Hornstein, NYS DEC	Brandon Muffley, MAFMC	Ellen Waldrop SC DNR
Jeff Kaelin, Lund's Fisheries	Allison Murphy, NOAA	Meredith Whitten, NC DENR
Adam Kenyon, VMRC	George O'Donnell, MD DNR	Angel Willey, MD DNR
Rob LaFrance, Quinnipiac Univ	Scott Olszewski, RI DEM	John Page Williams
Ben Landry, Omega Protein	Gerry O'Neill, Cape Seafoods	Chris Wright, NOAA
Tom Lilly	Derek Orner, NOAA	Phil Zalesak, Tall Timbers, MD
Brooke Lowman, VMRC	Nick Popoff, US FWS	Faith Zerbe, DE Riverkeeper
Sharon Luk, House Rep. (ME)	Will Poston, SGA	Erik Zlokovitz, MD DNR
Pam Lyons	Jill Ramsey, VMRC	Renee Zobel, NH, F&G
Shanna Madsen, VMRC	Harry Rickabaugh, MD DNR	

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The Atlantic Menhaden Management Board of the Atlantic States Marine Fisheries Commission convened in the Jefferson Ballroom of the Westin Crystal City Hotel, Arlington, Virginia, via hybrid meeting, in-person and webinar; Wednesday, August 3, 2022, and was called to order at 2:15 p.m. by Chair Mel Bell.

CALL TO ORDER

CHAIR MEL BELL: Okay folks, let's go ahead and get started. I'm Mel Bell; I'm Chair of the Menhaden Board, and we'll call the Menhaden Board to order. Welcome! We've got a fun, action-packed agenda today, literally. We're already 45 minutes behind or so. My objective is to get us finished here without having to order out for pizza, okay?

I'm sure they have good pizza here; but I don't want to do that.

APPROVAL OF AGENDA

CHAIR BELL: First item on the agenda is approval of the agenda. Do any of you have suggested changes to the agenda? I have one. Okay, we have one topic that we will discuss that has no action item, and that is a briefing on the stock assessment.

Dr. Amy Schueller, who graciously came up from Morehead City has to drive back to Morehead City as soon as she's finished. I would rather not keep her here late, so we're going to move her first, in terms of when we get to the items on the agenda. That will be one change to the agenda. Any objections to that? I don't see any, then that stands approved.

APPROVAL OF PROCEEDINGS

CHAIR BELL: Next, would be Approval of the Proceedings from the May 2022 Meeting. Are there any edits or changes necessary to the proceedings from May 2022? I don't see any hands. Then the proceedings will be approved.

PUBLIC COMMENT

CHAIR BELL: Okay, it takes us to public comment. Again, we're running a little late, but I know we

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have public comment in person, and I think online as well. What I would like to do is limit it to three minutes for each individual. We can start either online or in-person, whichever is easiest. Do we have somebody in person that would like to go first?

MR. PETER HIMCHAK: I'm surprised they called me so quickly. My name is Peter Himchak; and I work for Omega Protein. We are getting to the point where it's becoming intolerable to see the same public comments coming to this management board every time it meets. The particular comments only come from a few individuals. There are some form letters, or there are petitions now being circulated. There is always this accusation of overfishing menhaden in the Chesapeake Bay.

We're threatening the forage base of the predators. We would like to see some of these statements backed up by scientific fact or a publication. We rely on the ASMFC and its technical scientists are exploring the special component of the BAM. We've supported them through the ERP process, and we will consider to support them in whatever direction they go from here. But this whole issue of Chesapeake Bay. We hope it stays in the domain of the ASMFC scientists.

Just because you are constantly flooded with faxes and articles and letters, etcetera, etcetera, that talk about how we are crippling the forage base in the Bay. We would like to see that abate to some extent. We get tired of reading it, and hopefully you do as well. Until some science comes along, I just can't stand reading the same comments over and over, and I hope you feel the same way.

CHAIR BELL: Thank you, Sir, appreciate your comments. All right, we'll shift over to online. First, I have Phil Zalesak. Phil, if you would like to go first. Three minutes.

MR. PHIL ZALESK: Yes, Board members, and the representative of Omega Protein. My name is Phil Zalesak; I'm a recreational fisherman in southern Maryland. It's time to shut down the last remaining Atlantic menhaden reduction fishery on the Atlantic

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coast, as the overharvesting of Atlantic menhaden is destroying the future of striped bass in the Chesapeake Bay and beyond.

Allocating 71 percent of the total allowable catch of Atlantic menhaden to a Canadian reduction fishery, Omega Protein, is of no benefit to American fishermen or American taxpayers. That is a total of 136,313 metric tons or over 653 million fish per year allocated to less than 300 workers in Reedville, Virginia, and the corporate profits go to Canada.

This is truly stupid. I call it the Canada first policy. To add insult to injury, the Board annually allocates 51,000 metric tons of Atlantic menhaden or 244 million fish to Omega Protein, to be harvested from the Chesapeake Bay. That is 26 percent of the total allowable catch for the entire Atlantic coast. That's obvious overharvesting, and violates common sense, and is totally stupid.

These allocations violate the mission of the U.S. Commerce Department, the goals and objectives of this Board, and the fishing regulations of Virginia. These allocations are not an equitable allocation of a natural resource to all user groups. They are based on political science not biological science.

The Commission lowered the total allowable catch of Atlantic menhaden from 216 metric tons to 194,400 metric tons to decrease the mortality rate of striped bass. Did you hear that representative of Omega Protein? And I'll send you the references. But this Board has done nothing to protect the striped bass in the Chesapeake Bay, where striped bass feed and breed. Finally, it's time for the Board to live up to its goals and objectives to the benefit of American fishermen and American taxpayers. It's easy, just do the damn job. I thank you for your time.

CHAIR BELL: All right, thank you, Phil. Next is Tom Lilly.

MR. TOM LILLY: I would like to try and answer Mr. Himchak's of Omega Protein's objection. Sir, the Commission ERP work concluded that the commercial harvest should not exceed 4 percent of

the stock, if it did so it would damage the menhaden, and in turn would damage the striped bass. Because as you know, the main conclusion of that study, Sir, was that striped bass are the most sensitive fish to menhaden harvest. Mr. Himchak, how can you assure the public that you are not taking more than 4 percent of the menhaden present in the Bay?

Because from all the observations that we have seen, there are many days that your ships can't even locate any menhaden, substantial number of menhaden in the Bay, because you have harvested all of them. Please advise the public how you can assure them that you are not catching more than 4 percent. Can I have a little more time to give my statement, please?

CHAIR BELL: Stick to the time, Tom, and also, please address the Commission. You're not here to address anybody else, okay please?

MR. LILLY: Okay. The Chesapeake Bay spawning stock has failed, three years of the worst young of the year ever. Shouldn't the Menhaden Board be looking at the location of the harvest? The poor condition of the Chesapeake Bay in fish and wildlife is a goal for the following. That the Board determine the ecological, social and economic consequences of moving the factory fishing out of Virginia waters into the U.S. Atlantic zone, compared to leaving it where it is in the Bay.

This action is supported by the Maryland legislatures, legislators that represent over a million Marylanders, by charter captains, ten statewide fishing clubs and the Maryland Sierra Club with 70,000 Maryland members. In Virginia as you know, a petition has been filed by the Theodore Roosevelt Partnership that represents over 100 organization, CCA, Virginia Saltwater Sportsmen, and the American Sportfishing Association.

There has never been a time where the damage being done to Chesapeake Bay and fish and wildlife and the interest of millions of people by the reduction fishing industry was more obvious, and there has never been a time where so many

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responsible organizations are requesting the Menhaden Board to act.

A lot of people say that you will never face up to your obligations and the responsibilities to wildlife and the people of the Chesapeake Bay, protect American jobs and resources. We say, our menhaden delegates care about Maryland, about our communities, about American jobs. But they will act to protect and enhance Chesapeake Bay experience for millions of our fishermen, and these are our deserving caregivers, our veterans, our disabled, our retired.

There are millions of these Maryland families and children that find a special happiness together enjoying the wonders of Chesapeake Bay, as Sierra Club put it. The people and their representatives have done everything they can do to convince the delegates the menhaden delegates, especially the Maryland delegates, to carry out their duty at this meeting. We will know shortly whether this will happen or not. Thank you.

CHAIR BELL: Thank you, Tom, and we also have your written comments as well. I had at least one more online right now. Robert Newberry. If you would like to take three minutes. I think we're having some technical issues. He can't successfully unmute. All right, I think we have some technical issues here with unmuting Robert, so let's go ahead and move along in the interest of time.

REVIEW 2022 ATLANTIC MENHADEN SINGLE-SPECIES STOCK ASSESSMENT UPDATE

CHAIR BELL The first item will be Dr. Amy Schueller. Amy was the Chair of the Menhaden Stock Assessment Committee, and she is going to brief us, this is just a briefing no action here on the Assessment. Amy, take it away.

DR. AMY SCHUELLER: Good afternoon, everybody. Happy to be here and talk about the update assessment for Atlantic Menhaden. I guess I'll first off start by saying that you may have noticed that the report looked a bit different than it has in the

past. It was a modified report for updates, called a Term of Reference Report.

As I go through this presentation, I'm basically going to go through each of the terms of reference that were in that report, and hit on the sort of highlight items from that report. The first term of reference was to update fishery dependent data, including landings, discards, catch at age, etcetera that were used in the previous peer reviewed and accepted benchmark stock assessment.

Basically, I'm going to just talk about the landings. All of the other data pieces there, for example catch at age, etcetera, were updated but I'm not going to go through the nitty gritty details of all of that. I'm starting off with this is a time series of the reduction landings in thousands of metric tons over time from 1955 to 2021.

The boxes are colored, north in the dark and south in the light, so you can see which reduction landings were attributed to the southern area and the northern area. To remind everybody, the landings are split at Machipongo Inlet, with those landings in the Bay being in the southern region. Overall, landings have declined over time, and are clearly limited by the coastwide TAC in the more recent years.

We also updated the bait landings. This is bait landings in thousands of metric tons for the same time period. Again, south is in the white and north is in the darker color. Notice the scale difference here. I do have another slide sort of showing total landings with both combined. One thing of note on this slide is that there is this sort of change in the mid-eighties, so sort of 1985 to 1990 time period, compared to the last benchmark assessment.

That is and was addressed in this update assessment through a bridge run. Particularly, the states are able to update their landings data from 1985 to the present based on information that they have, and there were some updates that were done since the benchmark assessment, which changed the landings time series.

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It is best scientific information available, and it is the most accurate landings time series, and we addressed it through a bridge run, which I will talk about in future slides. This is the total landings coastwide for the duration of the time series. In this particular slide the sort of dark gray color is reduction, and then the black is the bait plus the recreational landings over time.

This just gives you an idea of the scale between the fisheries, and that the bait and recreational landings are becoming a bigger proportion of the total landings as we're moving into the future. For term of reference Number 2, it is to update the fishery independent data, so the abundance indices and then the associated age/length data that were available, that were used in the previous accepted benchmark stock assessment. We updated all of the indices. This is a picture of the index for the young of the year or recruitment index. In the past we may have called it JAI, Juvenile Abundance Index.

If you've been around a while, you've heard this called JAI, YOY, Recruitment Index. It's all the same thing. It's very similar to what the index looked like during the benchmark assessment, with just some minor nuances. In addition to that we also updated the adult abundance indices, and I included the table here for these indices.

We have termed those indices the NAD the MAD and the SAD, so sort of northern, mid-Atlantic, and southern adult indices. They are based on different sets of data. I really put this up here just to talk about which datasets go into which of these indices. The NAD is a combination of Connecticut lists, the Delaware Bay Adult Trawl, and the New Jersey Ocean Trawl.

The MAD is the Maryland gillnet with the VIMS shad gillnet, and then the SAD is the North Carolina p915 SEAMAP and the Georgia EMTS. The other reason I put this up here is just to show that not all of these surveys had data for 2020 and/or 2021, which is a common thing that I'm sure has been discussed at multiple boards, or anywhere that is dealing with

data regarding anything, really, because there is just a lack of data in some years.

I say all that to say that the Stock Assessment Subcommittee still determined that there were sufficient data to update the indices through the terminal year of 2021. Each one of these datasets at least had one dataset that went through the terminal year, and so we went forward and updated them.

I put those three indices on one slide here, the NAD, the MAD and the SAD, just to give you guys an idea of what they look like. We'll see them again later on, but they generally were fairly similar. I guess nothing stood out as a concern. Also, in the lower right-hand corner here is the updated MARMAP and EcoMon, or I've called it MARECO in a lot of places, just a combination of MARMAP and EcoMon.

It's another index that was included during the benchmark assessment, and the Stock Assessment Subcommittee censored it from this update assessment for various reasons, which I will get to in future terms of reference. The third term of reference was to tabulate or list the life history information used in the assessment and/or model parameterization, so things like natural mortality, start year maturity, sex ratio, and note any differences from the benchmark.

There weren't any notable differences from the benchmark, in fact I don't think there were any differences from the benchmark, except for the change in the terminal year of the assessment, which is why we did this update to begin with. The model years include 1955 to 2021. The plus group was six plus, so the model represents Ages 0 to 6, with 6 being a plus group.

There are two fleets in the parameterization of the model. There is a bait fleet and a reduction fleet, with each of those being split north and south. Two fleets, yet four different time series of landings and age compositions. Fecundity was time varying. Fecundity at Age, which was updated this go around, using the exact same methods used in the benchmark assessment, which were done by VIMS.

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Maturity was time varying maturity at age, based on the time varying length at age information. The sex ratio was fixed at 1 to 1 for males and females, and then the natural mortality vector was based on a scaled Lorenzen, using the tagging data analysis done by Liljestrand et al, which is what we did during the last assessment as well.

All right, term of reference Number 4, this is probably where I'm going to spend like the bulk of the presentation, I guess. It's to update the accepted models and estimate uncertainty, including sensitivity runs, retrospective analyses, and compare them with the benchmark assessment results, including bridge runs to document any change from the previously accepted model.

This update assessment had basically two changes that were decisions made by the Stock Assessment Subcommittee. All of the data were updated through the terminal year of 2021, but we did sensor two items. The first is we excluded the 2020 Southern Commercial Bait Age Compositions.

I put this figure in here as sort of our, just to show why we did that. I'll give a bit of an explanation. For the southern commercial bait fleet, there were a few samples taken for ages, and of the samples that were taken, I think all of them were Age 3. Basically, the age composition for that year looked odd compared to other years, just because the sample size was very, very low.

You can see on this figure, on the bottom part of this slide is something called the CORR. That is the correlation between the observed and predicted data. We want our predictions to be as close to what we observed in a catch at age as possible. You'll notice for 2020 there is this little red circle with an X through it.

That means we're doing a horrible job predicting what the age compositions look like for 2020, and that is because they were all Age 3s, which doesn't really match with the surrounding years, and it doesn't match with the estimated selectivity that we are estimating within the model. We censored those data, we did a number of runs looking at how

to handle data from 2020 and 2021 with respect to the age compositions, and all of that is in the report.

A lot of it is in the appendix, so if you want to look at that in further detail, you can. The second change that we made was the exclusion of the MARMAP EcoMon or the MARECO Ichthyoplankton Index. In particular, this index, I'll talk about it more later on in this term of reference 4, but the inclusion of this index was causing problems with.

If you don't run statistical catch at age models, maybe this is too much lingo, but the Hessian didn't invert, and we had a high gradient. Basically, what that means is the model didn't do a good job finding that sort of place where everything matched up cohesively within all of the datasets.

It didn't know what to do, because it couldn't fit that dataset with the rest of the data in the model very well. I'll show some more slides about that in a little bit. I just have a couple slides for what the base run looks like here. This is the full fishing mortality rate over time for the base run of this update assessment on the left, and then on the right is the full fishing mortality but broken up by fishery. Each of the colored bars represents one of the fleets, and so you can see here there is reduction north, reduction south, bait north and bait south. The red and green are the reduction fleet, and then the blue and pink is the bait fleet. I also included in here the recruitment and the spawning stock, which is the fecundity value. Remember the spawning stock biomass for Atlantic menhaden is based on fecundity and numbers of eggs.

On the left in here is the recruitment time series, as estimated from the update assessment. It looks very similar to what we've seen in the past, but adds a couple more years on. One thing about the recruitment estimation is that typically statistical catch at age models have a difficult time estimating recruitment at the end of the time series, because there is little data informing it, because it doesn't have that full age composition structure to inform whether or not it was a big recruitment class or not.

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In particular that's an even less data in this case, because the terminal year is 2021, and so we're missing some data for 2020 and 2021. What ends up happening is sort of you end up at your median value. For the figure on the right that is the spawning stock biomass over time. Remember that's in fecundity or numbers of eggs.

That was an extremely fast like what the base run looks like in a nutshell, and then now I'm going to compare it with a few different runs that may be of interest to the Board. The first one here is a bridge run. I already mentioned that the bait landings for the northern commercial bait landings, changed in 1985 in that mid-eighty section.

We did some runs to look at whether or not that had an impact on the overall outcomes of the model, and so this is the geometric mean fishing mortality rate for ages 2 to 4 on the left, and then the fecundity values on the right. Those are our metrics by which we're looking at for the benchmark, so that is why I included those.

You do, if you look in the mid-eighties, you know you see a little bit of deviation from the benchmark. The benchmark assessment is in green on here, the update, base run is in black, and then the red is using the northern commercial bait landings from the last assessment. Over all I would say that this wasn't a huge change, even though it does look like the landings changed quite a bit in some of the other figures.

These next two slides are looking at comparisons of the update assessment, which is in black, so it's sort of black with black circles. It's underneath a lot of the runs that are on here, with the benchmark, which is in that cyan blue, sort of that lighter blue color, with a bunch of different runs looking at how to handle the 2020 and 2021 data.

The red run here excludes 2020. Okay, I can't read this on my screen very well, but each of these runs excludes 2020 or 2021 data in different ways, and that's described in the report. Basically, we're looking at what are the impacts of that on this assessment overall. Mostly as you would expect,

the impacts are in the last few years of the time series, and generally they're not big impacts. I say that because this is going to be within the uncertainty analysis runs that we did. This is for the full fishing mortality time series on the left, and then the geometric mean fishing mortality rate for ages 2 to 4 on the right. Then on the left here is the recruitment time series. Then on the right is the fecundity time series. You can kind of see here that depending on the assumptions you make or which data you use for 2020 and 2021, that has an impact on what's going on with recruitment. Are you informing recruitment at the end of the time series with those age composition data, or not?

I say all that, and the Stock Assessment Subcommittee discussed this. There is just some uncertainty about the recruitment. It's one of the things that we're always uncertain about, so just something to keep in mind. The other difference between the benchmark and the update is the use of the MARMAP or MARECO Index. The ultimate result was that the Stock Assessment Subcommittee decided to sensor that index, although we did make recommendations to explore it further in the future.

One thing we did do was, we compared our benchmark from the last go around, which is a black line here, and our update, which is also a black line, with different terminal years for that MARMAP/EcoMon Ichthyoplankton Index, and those are the different colored lines here. Basically, in the early part of the time series in the eighties, the lines are pretty much all on top of each other.

But as you go into the more recent time series from 2000 on, that index is having a difficult time increasing at a rate at which the observed data are increasing. If you look at this slide on the left here, that is the observed index, which is the black open circles, and then the fits to that index are the individual lines.

There was a lot of discussion. There is some discussion in the report with respect to this. We plotted this plot on the right here, which is the fecundity in red, which is pretty flat, versus the

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observed MARMAP or EcoMon Ichthyoplankton Index in black, with the black open circles. Then in the blue open circles is the predicted index from the model.

The reason we plotted this together is because this index is an index of fecundity. It's basically a larval Ichthyoplankton Index, which we matched with fecundity. Some of the discussion that was had within the SAS was that there is a lot going on between when spawning stock biomass is defined, versus when the larvae are counted.

I think, you know, we're maybe missing some of the interactions that are occurring there, or maybe there is some nonlinearities that we didn't account for, which is why we made a research recommendation to look at this in the future and consider some different options, such as changes in catchability related to the index over time. Just to show you the impact that this exclusion of this index had compared to the benchmark.

We have on the left here the geometric mean fishing mortality rate for ages 2 to 4, and on the right is a plot of the fecundity over time. The black line on the top here is the benchmark assessment. The black line underneath all of the other lines with the black open circles, you can see it in some places, is this update assessment. Then all of the different colored lines are running the assessment with different terminal years for that Ichthyoplankton Index. We put this up here to basically show that the impact on the overall outcome of the assessment isn't significant. We do think that this was a reasonable decision to make, given that this was an update, and that we need to do some further work to look at this index in the future. One of the other typical analyses that is done for an assessment is something called a retrospective analysis. That is when we're peeling off terminal years of data to look at the impact of those terminal years of data on the overall assessment outcome.

The base run is in black here with black open circles, and that goes to the terminal year 2021. Then each of these colored lines says retrospective with a year. That is the terminal year for that

retrospective run. This is showing geometric mean fishing mortality rate for ages 2 to 4 on the left, and then on the right is the fecundity over time.

Generally, we want to see an even dispersion of those terminal year points above and below the line. The SAS did caveat this analysis, given that there were with 2020 and 2021 there were some data missing. It wasn't as uniform or as representative, in some cases, as it has been historically. You sort of take this analysis with a bit of a grain of salt.

That being said, this retrospective analysis looks pretty good, and it would be within the bounds of the uncertainty analysis that I'm going to show next. We did run the Monte Carlo Bootstrap Ensemble analysis, so the MCB or the MCBE analysis, and we ran it exactly the same way we did for the benchmark assessment, so we included the exact same uncertainty components, which were in particular natural mortality and fecundity, I think.

I just showed a plot of recruitment here, time series, and the black circles with the black line is the base run of the update assessment. Underneath of that in this slide is a dashed black line, which is the median of the runs. There are 4,000 some runs contributing to this figure. Then, the gray shaded area is the 5th and 95th percentiles of those different uncertainty runs.

Just giving an idea of the range of recruitment uncertainty. This is a plot of fecundity over time on the left, and then the geometric mean fishing mortality rate for ages 2 to 4 on the right. This slide is set up the same as I just described for recruitments. The base run is the black filled circles with the black line.

In this case you can see the black dashed line under there. That is the median of all those uncertainty analyses runs, and then the gray again is the 5th and 95th percentiles of those runs. That was term of reference 4, which basically tried to quickly walk through the update assessment itself.

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Then the thing that the Stock Assessment Subcommittee discussed at length during our meetings, and so I'm going to move on to term of reference Number 5, which is update the biological reference points for trend-based indicators or metrics for the stock, and determine stock status. This figure is one that ASMFC uses, and we updated.

This is the fishing mortality, and in particular it's the age 2 to 4 geometric mean fishing mortality rate, which is the fishing mortality benchmark that we use, based on the peer review. That is shown over time here in green, and then we have the two reference points. There is the ERP target is the blue solid line, and then the ERP threshold is the blue dash line. The management board moved forward with using the ERP targets and thresholds, and so that is what we are basing our stock status on. As of right now, the fishing mortality rate for 2021 is below the ERP target. Okay, and then the alternative reference point is fecundity. This is in quadrillions of eggs. The green here is the fecundity value over time from 1955 to 2021.

Then the solid blue line is the ERP target, and then the dashed blue line is the threshold. We've been above the threshold for fecundity for a number of years, and then in the most recent terminal year the fecundity value is above the ERP target and the threshold. The question is always, well what does this look like compared to, you know our uncertainty analysis.

We did not run every single version of this model through and get an ERP with every single iteration of the Monte Carlo Bootstrap runs that we did, but we are comparing this, just to give like an indication of what the time series look like with respect to those reference points. On the left here is the geometric mean fishing mortality rate over the ERP threshold. We are below that in all of the runs in the uncertainty analysis. We're below that.

Then on the right is the fecundity time series over the fecundity threshold. In the terminal year, the majority of those runs were above that, which is where we would like to be. Stock status with respect to fishing mortality rate and fecundity, so

the F for 2021 over the F threshold, remembering that this is the ERP threshold at 0.28, and then the F 2021 over the target. Again, the ERP target is 0.85.

We want those values to be, well we want the value with respect to the threshold to be less than 1. The value of the target is sort of the purview of the management board in their risk. For fecundity, the fecundity value in 2021 over the fecundity threshold is 1.76. We want that value to be over one, and we are. Then for the target we're also above 1, which is 1.28. For stock status we are not overfished, and overfishing is not occurring.

Just to reiterate, this is with respect to the ERP benchmarks that were adopted for this species. Term of Reference Number 6 is to conduct short term projections when appropriate, and discuss assumptions if they're different from the benchmark. Projections were run. We gave one example. We used the exact same methods as in the benchmark assessment, and we projected at a TAC of 194,400 metric tons, which is the current TAC. We used the exact same allocations.

Pretty much just showing you what it looks like if you stayed with status quo, with the expectation that you will request additional projections to be run for your consideration. But the SAS not wanting to guess at the possibilities of what those could be, so just providing this as a kickoff point for you guys to then make some decisions about what you want to see for projections.

To remind you, during the last benchmark assessment we moved towards using a method called nonlinear time series analysis for projecting recruitment. That is basically using the time series of recruitment and its internal coherency, to predict forward what we expect the recruitment to be in the future. We maintained that for this assessment, and just to sort of reiterate, we moved to that method because it showed that we did show that Atlantic Menhaden had good internal consistency within its recruitment time series, and that it was able to predict forward fairly well, and it actually ends up giving us a little bit smaller confidence interval on our recruitment projections than what

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we had been doing in the past. This is the projections of the current TAC of 194,400 metric tons. In the upper left-hand side is the fecundity in billions of eggs. In the lower left-hand side is the fishing mortality rate. In the upper right-hand side is recruitment, and then the lower right-hand side is landings. Landings is one straight line at 194,400 metric tons, because we're specifying that.

In the other figures you see several black lines. The black dashed line is the median or 50th percentile across all the runs for the projections. The dashed lines are the 25th and 75th percentiles, and then the solid black lines are the 5th and 95th percentiles. Then in the figures on the left there is an orange line, which is the ERP target for fecundity and fishing mortality rate respectively, and then the blue line for the threshold is on there too.

You guys can see sort of where you are with respect to that target and threshold. When you look at this for 2022, if you are catching what you caught. This last year you have the same TAC. You are below the fishing mortality rate target, and you are above the fecundity target for 2022. As you move forward in time you get closer to that target.

All right, term of reference Number 7 is to comment on research recommendations from the benchmark, and note if there has been any progress, and if we have any further research recommendations. I tried to keep this short, they are in the document. But I'll go through a couple that were sort of highlighted.

The first was to develop and implement a coastwide menhaden specific multiyear fishery independent index of adult abundance at age, with ground truthing for biological information. You guys, if you've sat at the table for any length of time, know that we've asked for this over and over and over again.

Congress did include Chesapeake Bay Atlantic Menhaden Abundance Provision in their fiscal year 2022 Consolidated Appropriations Act, so there is some movement happening at a higher level. Mike Wilbur did a project to evaluate potential survey

designs for an aerial hydroacoustic survey within the Chesapeake Bay specifically.

However, no funding has been attached to these projects, and they remain unimplemented. But there has been some Board movement on this, which is nice to see. Continue current level of sampling from the bait fisheries, particularly in the Mid-Atlantic and New England. That is a wish from the Stock Assessment Subcommittee.

We're noting here 2020 and 2021 had reduced sampling. Everybody knows that because of the global pandemic. But the SAS does not expect that this will continue past the pandemic, so we do expect, as we're moving past 2020 and 2021 that the levels of sampling will increase, and we hope to see them increase even more.

Conduct an aging workshop to assess precision and error among aged readers with the intention of switching the bait fishery age reading to state aging labs. This was discussed during the last benchmark assessment, with the intention of having an in-person aging workshop. Again, this was postponed due to the pandemic, but there is still a want and a need for this to happen. It's still on the list. I just made a note here. These are just a couple that we picked out to present, but there is a full list of research recommendations in the report itself. That runs me through all of the terms of reference. I basically just have this slide to start hopefully discussion, and about what the Board would like to see for projections, and what they would like to request for their next meeting.

In the past, the Board's request, some options similar to what's up here. This is, you guys have requested based on a percent increase to the TAC or decrease to the TAC of some percentage, usually 10 to 40 percent increase, and what do the risks look like with that. You've also requested, based on some percent probability of exceeding the threshold or target, what would the landings be, or what would the TAC be?

The example here is an example of 50 to 60 percent probability, so if I want to exceed the ERP target or

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threshold, that's your choice, by some amount with some risk level, what are we looking for? I put this up here as just a queue to you guys, as to sort of what would you like to see for projection runs? Then I just have a slide here for any questions on the presentation of course, and on the assessment itself.

CHAIR BELL: All right, thank you very much, that is very detailed, and thank you for the work of the Subcommittee and all you've done. First of all, any questions for Amy? Claire, oh it's Allison Colden. Go ahead, Allison.

MS. ALLISON COLDEN: I will echo thanks for your presentation, and for your work, Amy. I just have a question on the projections for recruitment. It looked like, recognizing too that you mentioned during your presentation that recruitment is one of the trickier aspects that you guys are working on within the assessment.

It looked like for the top end, from the median up for those projections, that there would be a decline in the out years of recruitment under the existing or the current TAC. Can you comment on that at all, or do you have any indication of why that might be expected, when it looks like the fecundity and the abundance were within the ERP target and threshold level?

DR. SCHUELLER: Yes, that is a good question. The way in which the recruitment is projected is it basically takes the terminal year, and it says okay, I'm in this state space. That's what it's saying, and then it says what other points in the past have been in this similar state space, and where did they go?

What you have at the end of the time series is you have points in a certain state space, and they're moving in the same direction. Then you have a new point. It's going to do that every single time. I guess my statement is, just it's because of where the state spaces are forcing it to go as it's moving through time. I don't know that I have a super satisfactory answer besides that.

I will say during the benchmark assessment, we did this moving window analysis of this method, and we projected for ten years like, you know we peeled off time and said, okay if we were projecting this from you know 1995 or something forward, how close would we get? We did pretty well. I mean it's just using what I'm calling that internal consistency within the recruitment time series, and that's where it's putting you, based on the state space of those recruitment points.

CHAIR BELL: Any other questions? Yes, Conor.

MR. CONOR McMANUS: Thanks for the presentation, and nice work to the Assessment Committee. Just to follow up on the EcoMon. It sounds like the recent years caused challenges for fitting of the model. The hypothesis is that there is a misalignment, perhaps of spawning in the survey.

I guess did you look at the sampling intensity or sampling periods to see if those differed from previous years, to kind of test that, or could there be other things like reduced larval production perhaps, or different spatial mismatch in where the sampling is occurring and where they are spawning?

DR. SCHUELLER: Yes, I'm just conferring, because I can't remember every fine detail of everything, so 2021 was missing. But the rest of the years were similar. It isn't just a phenomenon in like the last couple years since the benchmark, meaning there is an uptick in the larval index. It looks like from 2010, 2012 on there is this increase in larvae over time.

You know because this was an update, we didn't have a ton of time to explore what would be going on there. But we did discuss it, and what's happening is the model has one sort of catchability coefficient for that whole time series. It's having a hard time estimating that value while also trying to get an uptick in the index, given that the fecundity information or estimation is still relatively flat but variable.

The fecundity is informed by that index, but all the other data components and pieces, and so there is some like incongruity between sort of all those

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other pieces and this piece. We need to figure out what that is. We did have a discussion about why that might be, and there is a lot of different possibilities.

But we weren't necessarily able to rule them out, given the timeframe of the update. That's why we made a research recommendation to look into it further. Keeping in mind that this is one dataset in a whole group of datasets, and when we did run this assessment without the index, and compared it with a benchmark and this current update, there wasn't extreme differences in the overall model outcomes. I hope that answers your question.

MR. McMANUS: Yes, thank you very much. Just trying to think through how missing surveys, difference in timing of sampling from year to year may impact the ability for the model to fit the data. Thanks, appreciate it.

CHAIR BELL: Any other questions? Yes, Lynn.

MS. LYNN FEGLEY: Thank you so much, Amy, for this presentation. I'm not entirely sure where this question belongs. Just please put it off if it's not in the right place, but it really is about the projections, which it looks like are through 2026, based on the current ERP. My question is, the next ecological reference point bench for update is schedule for 2025, I think. I guess my question is, what are the conditions under which those ERPs that we're projecting against might change, and when might they change? What would be the scenario where they would be lower or be higher, so that maybe we can just have that in the back of our mind when we do our projections.

DR. SCHUELLER: I can speak to that. I don't know if it's my place. But you're right, the next benchmark assessment for Atlantic menhaden is in 2025. I mean one of the things we do discuss is how many years to project forward, and what to provide. You guys can do with that what you will, right. If the expectation is that you will be delivered an assessment in 2025.

I mean let's face it, the real expectation will probably be winter meeting of 2026, by the time you would get it. Usually that's what happens. It comes in February, I think. My expectation would be you would use this through 2025, and then 2026 is a question, right. What are you going to do? These are projections for you guys to use to inform your management decisions. You know you can take them how you will.

CHAIR BELL: All right, other questions. We can shift to the question you had for us, I guess, guidance for the Committee, assessment folks, in terms of coming back to us with a future meeting. Yes, Megan.

MS. MEGAN WARE: Thank you, Amy. Yes, I had some, I guess suggestions for different projections to look at. Based off of Lynn's question. I guess they would be for 2023, 2024, and 2025. But I think the Board would still have the option at the next meeting to only set for two years if we so chose.

I guess I'm asking for three years, acknowledging that may not be what the Board ultimately chooses. I think you've already done one of them, which is our existing TAC. I would be curious, at a 5 and 10 percent increase in the TAC, and I'll just note the 10 percent increase, I think is 216, which is what we were at a few years ago.

Then kind of the other style of projection, looking at a 40, 50 and 60 percent probability of exceeding the ERP target. I think in the last round we saw those as individual years, and then also there was a run where they were all combined. I found that really helpful, so if that is possible, I realize that is probably more work given it is three years. Feel free to comment on workload, but I found that comparison really helpful last time. Thank you.

CHAIR BELL: All right, thanks for that, Megan, any other suggestions, desires of the Board? Nichola, do you want to go?

MS. NICHOLA MESERVE: I agree with Megan's suggestions, and was just going to ask that the probability-based projections be at the 5 percent

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increment, not 10 percent, which was similar to the last time you asked for projections.

CHAIR BELL: Thanks. I had another hand, yes, Ma'am. Allison.

MS. COLDEN: Similar to our last round of projections as well, I was going to ask if we could do the 5 and 10 percent below the current TAC for completeness, and so that we can see the full range above and below the existing TAC.

CHAIR BELL: Tom.

MR. THOMAS P. FOTE: As in the last couple years stimulating my thought. I'm trying to think if there is any speculation of what climate change is doing with the menhaden population. Because I look at nursery areas, we know it is affecting striped bass because of the warming of the waters. We know it's affecting other species like that, and do we have any idea, because as the Bays and estuaries warm up and we have more algae and plankton blooms, will there be any affect in the menhaden, or have we seen any?

CHAIR BELL: Other ideas, suggestions? Kristen.

DR. KRISTEN ANSTEAD: Yes, so in the previous benchmark Rob Latour did an analysis for us, a habitat analysis with all the data from the indices that we used, and looked at salinity profiles, temperature and kind of graphed ideal ranges for menhaden, based on the data that we have from our surveys, and we did not redo that for the update. But we could look into doing that again for the benchmark, and that at least gives us an idea of where menhaden tend to be, in which ranges, and where we are currently.

CHAIR BELL: Okay, thanks, Kristen, anything else?

DR. KATIE DREW: Can we get just a clarification from one of Megan's requests, where, so you had asked for looking at runs that would give you a 40, 50, and 60 percent chance of being at or above the ERP F target. You had said we could do that in each

year, which would give you a variable TAC every year, then for sort of a one TAC option.

The question would be, obviously you're going to get as recruitment comes in and goes out, you're going to get different percentages if you keep the TAC the same. When you say you have like a 40 percent chance of being at or above a target, do you mean in that first year, in the last year, in the middle?

MS. WARE: Yes, I mean the maximum TAC for those three years that keeps all three years at the 40 percent or 50 percent.

DR. DREW: All three years would have no more than a 40 percent chance of being at or above the target.

MS. WARE: Yes, all three years would have no more than a 40 percent chance of exceeding the ERP target.

DR. SCHUELLER: I just want to clarify too; you want me to cut 2026 off.

MS. WARE: That would be my recommendation. I'm not comfortable at this point setting a TAC for 2026. That seems pretty far off.

DR. SCHUELLER: Sure, I can do that really easily.

CHAIR BELL: Online, Rob LaFrance.

MR. ROB LaFRANCE: I just wanted to agree with the idea that we take a look not only at going up higher with the TAC, but also taking a look lower. I do think that is very beneficial. I think what I just heard about the idea of trying to take a look at some of the habitat impacts and some of the ecological aspects, I think makes a lot of sense.

CHAIR BELL: Anything else? I think you've got a good list there.

DR. SCHUELLER: Yes, we're just conferring with one member, to make sure we didn't miss anything. I mean I'll summarize. It looks like clearly 2022 is going to be projected at the current TAC. Then

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we're looking to project for 2023 to 2025, plus and minus 5 percent and 10 percent, so in 5 percent increments around what 194,400 is for those three years.

Then we're also looking for a 40, 50, and 60 percent risk of exceeding the ERP F target for two different options. One for the individual years, so variable TAC, and then two, for all years combined, where we're basically looking for the maximum TAC value that keeps all of the years below that target risk percentage that we stated. Okay, so we want 40, 45, 50, 55, 60. Okay. Did we capture everybody's requests?

CHAIR BELL: I don't see any hands.

DR. SCHUELLER: I see a lot of head nodding.

CHAIR BELL: Good job! Thank you, everybody. Do you need anything else from us then? All right, then we're concluded with this particular item, so thanks, thanks so much for all the hard work again, the Subcommittee and for being here.

CONSIDER FISHERY MANAGEMENT PLAN REVIEW AND STATE COMPLIANCE FOR 2021 FISHING YEAR

CHAIR BELL: All right, well thanks, folks, we'll move along then. We're going to go back to the originally, I think it was Item Number 4 on the agenda, which would be Consider Fishery Management Plan Review and State Compliance for 2021 Fishing Year, and James Boyle is going to walk us through that.

MR. JAMES BOYLE IV: Nice to be here in person with everybody, and start putting some faces to e-mail addresses mostly. Yes, I'm going to go through the 2021 FMP Review, and a lot of it will seem familiar from the data update I presented in May. I'll probably try to go pretty quickly through some of those sections.

Here is a quick overview of the presentation. I'm going to start out with a very brief reminder of the status of the FMP with last year's TAC, although we did get reminded in the last presentation as well. Since we just had the presentation of the stock

assessment update, I omitted the usual status of the stock section of the presentation. I'll be able to move on straight to the landings information that I presented in May, and then the compliance requirements and PRT recommendations, and then I'm going to return to the landing's information at the end, because I have a bit of an update with validated landings, and the discussion around that should apply both to the FMP review and possibly the Addendum we'll talk about later going forward as well. Just a quick reminder of the FMP.

Amendment 3 approved in 2017 and implemented in 2018, is still the most current management document that the fishery operates under. For notable changes from 2020, the Chesapeake Bay cap was returned to 51,000 metric tons as outlined in Amendment 3, and the Total Allowable Catch or TAC for the 2021 and 2022 fishing season is set at 194,400 metric tons, based on the Board approved Ecological Reference Points or ERPs.

The 2021 landings, this is the same as I showed in May. The total landings including everything directed, EESA, and incidental catch or small-scale fisheries landings amounted to 195,092 metric tons, or about 430 million pounds, which is approximately 6 percent higher than 2020, and 0.36 percent over the TAC if incidental catch was counted against the TAC, which it is not.

The nonincidental catch, so if you take those incidental catch landings out, is at 189,343 metric tons or 417 million pounds, which is also a 6 percent increase from 2020, and about 97 percent of the coastwide TAC. The incidental catch on its own is 5,750 metric tons, or something like 7 million pounds, which is a 9 percent decrease from 2020.

Also, I don't have a slide for you, but I'll throw a quick note in that I presented the quota transfers to be 17 in May. Between some new ones and some corrections, it's actually 25. I bring that up, because it is part of the objectives for the reason the Addendum that we're going to talk about later.

Next to look at the reduction fishery, again this has not changed. The reduction harvest for 2021 is

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estimated at 136,690 metric tons, or 301.3 million pounds, which is a 10 percent increase from 2020, but only 0.06 percent above the previous five-year average. Of those landings, about 50,000 metric tons came from Chesapeake Bay, which is approximately 1,000 metric tons below the Chesapeake Bay cap.

This figure shows landings in the reduction and bait sectors over time. The reduction landings are on the left-hand axis, and bait landings on the right. Note the different scales. The reduction landings are an order of magnitude larger than bait landings. The overall trend is still reduction landings declining, bait landings increasing, although 2020 to 2021 differences are slightly against those trends, but overall, the trend is the same.

A breakdown of the incidental catch over time. As I mentioned previously, the total was 5,750 metric tons, or about 12.7 million pounds, which is a 9 percent decrease. There were six states that reported incidental catch from 2021, that's Maine, Massachusetts, Rhode Island, Connecticut, New York and New Jersey.

Eighty-eight percent of those landings came from purse seines, and 9 percent from gillnets. The state of Maine accounted for 96 percent of the total incidental fishery landings in 2021. The incidental catch trips were lower than in 2020, but still higher than 2016 through 2019. In the episodic event set aside there were three participating states, Maine, Massachusetts, and Rhode Island. Their total combined landings were 2,213 metric tons or 4.9 million pounds, which was over the total set aside by 592,250 pounds. But a few quota transfers and donations at the end of last year and then earlier this year resolved that, so there was no overage going into the 2022 fishing year.

Moving on to the biological monitoring requirements, which was not presented in May. We have the non de minimis states are required to conduct biological monitoring, based on their landings as well as their geographic region. From Maine to Delaware, they are required one 10-fish sample per 300 metric tons and from Maryland to

North Carolina it's one 10-fish sample per 200 metric tons. In 2021 Massachusetts, Rhode Island and Connecticut fell short of their required samples, but I have some explanations and a compliance report here.

Massachusetts received a number of quota transfers to extend their fishery August 5th, but then were not able to complete the additional monitoring before it closed again five days later on August 10th. In Rhode Island some late reported landings pushed them from the four required sample sets to five, and so they only got the four 10-fish samples.

But they did note that over those four events 55 fish were sampled from the fishery, as well as an additional 49 from the coastal trawl survey. Connecticut has long faced difficulties collecting bait samples, and they rely primarily on their Long Island Sound trawl survey for sampling, which produced 103 age samples and 302 length samples over 139 tows.

The de minimis requests were the same as last year, so as a reminder to be eligible for de minimis status a state's bait landings must be less than 1 percent of the total coastwide bait landings for the most recent two years. The states of Pennsylvania, South Carolina, Georgia and Florida all requested and qualified for de minimis status for the 2022 fishing season.

For the PRT recommendations, the PRT continued to discuss a topic that was brought up in last year's FMP review, whether a sufficient number of samples are being collected from different gear types and regions, and whether substituting from fishery independent sources is appropriate for meeting the requirement.

The PRT reiterated its recommendation to reevaluate the sampling requirements, and suggested the Board task the Technical Committee with conducting a review of the requirements. Now having said that, after the PRT made that recommendation, we had a discussion with the, we the policy staff not the PRT, had a discussion with

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the science staff, and we went ahead and put that request to evaluate it in the draft terms of reference for the benchmark stock assessment in 2025. In the next six months or so those draft TORs will be presented to the Board.

They have gone ahead and done that. With that, the actions for the Board today are to approve the 2021 FMP review and state compliance, and approve the de minimis requests for Pennsylvania, South Carolina, Georgia and Florida. That brings me to the landing's discussion. The information I just presented comes from the state compliance reports, but because it's an assessment year and because the Board requested 2021 landings in the Addendum. The data were validated in time for this meeting. Now most years, data are not validated on the state-by-state level by species, and go through the normal ACCSP process. This slide shows the differences between the validated landings on the left, and the compliance report landings on the right. From the validated figures, the total commercial landings, included directed incidental catch and EESA landings, are estimated at 195,481 metric tons, or about 431 million pounds, which is approximately 6.2 percent above the 2020 values and 0.56 percent over the TAC, again if incidental catch was counted against that.

The nonincidental catch fishery landings are estimated at 189,500 metric tons, or 418 million pounds, which is 6.6 percent increase in 2020, and represents about 97.5 percent of the coastwide TAC instead of 97 percent. Landings from the incidental catch fishery in total are 5,981 metric tons, or about 13.2 million pounds, which is still a 5.5 percent decrease from 2020.

For context, out of the 15 states that have their data validated, so for example Pennsylvania is excluded, because they don't have any landings. Out of those 15, 6 matched exactly between their compliance report numbers and their validated numbers. The differences varied from as little as one pound to more than 700,000 pounds.

The biggest difference for an individual state was 3.5 percent from compliance reports to validated

landings. I'm bringing this up here, because how the Board chooses to address this issue or not, affects both how we monitor for compliance and calculate overages, and possibly how we set allocations, depending on the options chosen in the draft Addendum coming later.

One suggestion that came from the PDT, not the PRT, because we first discovered this issue working on the Addendum, is to move the compliance report deadline later. On April 1st, when compliance reports are due, some states are still working with preliminary data, especially on the specific, like gear type level on the very small level.

Moving the deadline could improve accuracy. On top of that staff was reviewing Amendment 3, and the timing of validated landings data does not line up with the payback provisions in Amendment 3 very well. While the Amendment says that overages need to be paid back in the subsequent year following the overage, so if you have an overage in 2021, it needs to be paid back in 2022.

What we've found out is that final landings aren't really ready until midsummer, so you could have a situation where states need to remove quota in the middle of a fishing year. As far as the FMP review is concerned, we recommend the Board consider moving the compliance report deadline later, possibly the summer, like July 1st was the example we said.

Then as we pivot to the Addendum discussion, staff will be recommending a new option for the Addendum that opens paybacks to the following year after the subsequent year. If we find an overage based on validated data in the middle of the year, states can pay it back in the next year, if needed, so then they can plan for having that less quota in their fisheries. Are there any questions?

CHAIR BELL: Yes, Lynn.

MS. FEGLEY: Thank you so much for that report. Just out of curiosity, did you reach out to states who have the largest differences between their validated, you know their two sets of data, to see if

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moving the deadline would help them, or if it was some other issue for them?

MR. BOYLE: We did reach out to a lot of the states that had some of the biggest differences, especially in working to create the tables in the Addendum, to make sure they were accurate, and especially also because normally the validation process doesn't break the landings down into categories, so we needed that as well. I do believe they said that that would be a significant help, I believe.

MS. TONI KERNS: We didn't discuss it specifically. I did have a conversation with one or two states earlier on in the compliance report process, in particular those states that do not have their landings divided up by gear type early on, and they can't provide that. All they can provide is the total, and those states had said that a later date would be beneficial to them. Several of the PDT members did say that it would be helpful.

CHAIR BELL: I guess then the question is, is there interest from the Board in moving the date for the compliance report? Chris and then Megan.

MR. CHRIS BATSAVAGE: I think I heard it correctly. The proposed compliance report date you're thinking of moving it to is July 1st, is that it? Okay. Yes, I think any push later in the year will help the final landings. The only thing I would I guess consider is the number of other compliance reports that are also due on July 1st.

You know you have staff internally review a lot of these before they get sent to ASMFC. I think there might already be six that are due on July 1st, so I'll know if June is workable or if August is too late, but just something to keep in mind, as far as if we decide to move the compliance report due date for menhaden. Thanks.

CHAIR BELL: No, it's a good point, Chris. Megan.

MS. WARE: I think it may be prudent to move it back. I think that would help several states. James just to help you a little bit. My recollection is having a month to compile the FMP review from 15 states

is a lot of work in a little time. If you choose July 1st, you're setting it up for the same kind of situation, where the first week of August is when you have to report out. I don't know if June 15th might give you a little extra time, unless you have a different system you've set up. But my recollection is that was always really tight.

CHAIR BELL: Toni, do you want to weight in here?

MS. KERNS: Our intention was to not provide an FMP review until the annual meeting if we switched it to July 1st, Megan, just because of what you said. I just did a quick count, Chris, you are correct. We currently have six compliance reports due on July 1st, this would make seven. If we did it in August, if we had August 1st, that would make a total of four due then. That would be the same for June, it would make a total of four due then. I think if we did August 1st, we would still have enough turn time to provide the FMP review at the annual meeting as well.

CHAIR BELL: Okay, so August 1st is kind of, does anybody have a problem with August 1st? It's my birthday, just thought I would mention that. See what I did on my birthday this year. Okay, do we need a motion for that or just general consent? Okay, is everybody good with that? We will move the compliance report for menhaden to August 1st, for all the reasons we just discussed. Yes, I guess we probably would need a motion for that, yes to accept the compliance reports.

MR. JOHN CLARK: Is that motion prepared? I would be glad to make it.

MR. BOYLE: Yes, I think Maya prepared a motion.

MR. CLARK: Ah, the magic mysterious Maya. There we go. You want to read that or I can read it.

CHAIR BELL: Go ahead.

MR. CLARK: Move to approve Fishery Management Plan Review, state compliance reports and de minimis requests for Pennsylvania,

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South Carolina, Georgia and Florida for Atlantic menhaden for the 2021 fishing year.

CHAIR BELL: Okay, that knocks out two things. Yes, is that a second, Pat? Pat seconds. Any discussion of that? Any objection to the motion? Toni.

MS. KERNS: Mr. Chair, since Maya is not here, I just wanted to make sure she knew it was Pat Geer.

CHAIR BELL: Okay, yes. **No objections to the motion? All right the motion carries, great.** Does anybody need a break? Okay, I don't see any hands. If I can do this you can do it.

CONSIDER DRAFT ADDENDUM I TO AMENDMENT 3 ON COMMERCIAL ALLOCATIONS, EPISODIC EVENT SET ASIDE PROGRAM, AND INCIDENTAL CATCH/SMALL-SCALE FISHERIES FOR PUBLIC COMMENT

CHAIR BELL: All right, it takes us to Item 5, now we're going to get into Draft Addendum I to Amendment 3, so we've got some unfinished business there we need to clean up, right? James will walk us through that and hopefully this will go smoothly.

MR. BOYLE: I'll just jump right in. A quick outline of the presentation. I'm going to give a very quick overview and recap of the process that we've gone through until this point. Then I'm going to move on to covering the contents of the Draft Addendum. As in previous meetings, I'm going to go section by section, and pause for discussion and motions at the end of each one.

First the allocations, and then the EESA, and then incidental catch. Those will all be done separately. The goal of today's meeting is to finalize the options in the document, and consider approving it for public comment. Additionally, going off what we discussed just now at the end of the FMP review, staff is recommending adding language into the Addendum that will allow for overage paybacks in the year following the subsequent year from the overage.

A quick recap. The Board initiated the development of Draft Addendum I in August of 2021. The first draft was presented to the Board in January of 2022, after which Board comments were incorporated into the document and presented again in May, where the PDT received further edits that are included in the version presenting here today. Ideally the document will be approved for public comment today, and hearings will commence from August until October, and the Board will consider final approval at the annual meeting in November. Like I said, to help work through the Addendum we're going to take each section at a time, and consider Board action specific to each section.

As a quick note, there are two options, two sub-options removed between briefing materials and supplemental materials. The total is 33 options not 35, as is written in the document. There is only one option remaining that the PDT specifically recommends removing. But any additional options the Board would like to remove, will always help ease the process going forward, presenting it to the public.

First up is allocation. The objective of the options in this section are to align with the recent availability of the resource, enable states to maintain current directed fisheries with minimal interruptions during the season, reduce the need for quota transfers, and fully use the annual TAC without overage.

The PDT used the same two-step approach as outlined in Amendment 3. First, we're going to consider the fixed minimum allocation step, and then second is allocate the remaining TAC based on the timeframes. Before I start going through the options, the tables that are associated with each combination of the two steps are in the Draft Addendum provided in supplemental materials, if anyone would like to compare.

Then I have them in the presentation here, but I think it's easier to see them in the document, so we'll just skip through those when I get to the slides of that. Okay, so for the fixed minimum approaches we have the status quo option of 0.5 percent to

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every state, and a three-tiered option that would have different minimums for different groups of states.

The PDT developed the tiered option to reduce the amount of TAC that was reserved for minimum allocations, while still allowing for states to acquire the necessary allocation when combined with the second allocation step. Under the status quo option, 8 percent of the TAC is apportioned out to the fixed minimum, and under the tiered option that would be reduced to 5.53 percent.

The three-tiered option still contains the changes made by the Board at the January meeting, of course, and the PDT previously voiced their concerns over that, but have no new recommendations regarding those options. Moving on to Step 2. Options 1 and 2 are fairly straightforward. They are the average landings from each of those listed timeframes, the current one being 2009 to 2011, status quo.

I'll add a quick reminder that at the last meeting the Board voted to replace 2020 with 2021 landings in all of the relevant options, so that is reflected up here. For the weighted timeframe allocation, the PDT still recommends removal of Timeframe Number 2, or Option 3B. The Board requested two versions of the weighted allocation timeframe be developed in October of 2021. While the state allocations vary slightly between the two versions, by expanding the range of years by one, they are conceptually the same. The PDT reiterates its recommendation that Timeframe Number 2 be removed, because the same objective is achieved with Timeframe Number 1, which utilizes the original timeseries that we use now, and then adds on the most recent three years. Then we have Option 4, which is the moving average option. In response to Board concerns in the January meeting about the types of landings that can affect the moving average, the PDT split Option 4 into three sub-options, two of which remain after the May meeting.

Option 4A represents the original moving average method that include all catch types, including

episodic even set aside landings and incidental catch or small-scale fisheries landings to most accurately reflect the distribution of stock and effort. The PDT continues to support the retention of this option, as it's the most responsive to the current fishery. But if the TAC is exceeded, it could impact states that use their full quota.

Option 4B only uses landings under or equal to the TAC in the moving average calculation. This option recognizes the importance of incidental catch and small-scale fisheries landings, and episodic events landings in a state's total landings, to reflect stock distribution, and as a way to move averages up, if needed.

However, it does not reward states for activities that could lead to overfishing, such as exceeding the TAC, and it does not damage existing markets in other states by, for example, shifting quota away from states that fully utilize their allocation. A proportional allocation of the incidental catch and EESA landings among participating states eliminates concerns about the timing or availability of when fish become available, so it's not a first come first served situation.

The PDT supports the retention of this option, as it adds protection for states that fully utilize their fishery, but is not as representative of the current fishery as in Option 4A. Due to the fact that in 2021 incidental catch landings put the total harvest above the TAC, this is the first time we could utilize the calculation to only count a portion of those landings, and there is a full explanation of that calculation in the document, if you would like to see it in more detail.

Here we are, we've gotten to the tables. If anyone has any questions, I'm happy to try to answer them, but otherwise they are the same as have been presented before and have been in the document before, except with the update of replacing 2020 landings with the validated 2021 landings. I think Maya, we can go ahead and skip to Slide 16, please, which brings us to the end of the allocation section. Are there any questions?

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CHAIR BELL: All right that's simple, any questions at this point? I don't see any hands. We have recommendations from the PDT. There is the PDT recommendation that we have, and they have been consistent.

MS. KERNS: Maya, do you want to put that slide back up? I think it was on.

MR. BOYLE: It's Slide Number 8, please.

MS. KERNS: We're in the PRT presentation somehow, Maya.

CHAIR BELL: Again, remember what we're doing is just approving for taking it to public comment, so there will be much more time with this. But the PDT has been pretty insistent in their appeal for some simplification if we can. Joe then Cheri.

MR. JOE CIMINO: Yes, and I appreciate that. I think the PDT has really gotten this document to a really impressive place. I've been fighting to keep Option 3B in. It's more inclusive of data. You know there is a lot of interannual variability in the landings for this species. I don't think it makes this a more complex document, slightly larger with more tables. But the understanding of, it's a different set of years, not any older data, just more inclusive. I would like to see it stay in.

CHAIR BELL: Joe would like to see it stay in, well, Cheri, you're next. You don't have to comment on that if you don't want to.

MS. CHERI PATTERSON: Well actually, I was going to agree with the PDT and recommend that it be removed. I think that there is just a lot of similarities to it, and there is not much difference.

CHAIR BELL: Right, and they pointed that out, I think consistently to us. Someone in favor, some want to leave it in, take it out. Any other thoughts on that? All right, well if someone wanted to make a motion one way or the other, I guess we could do it that way. Cheri.

MS. PATTERSON: I would like to make the motion to remove Option 3B under 3.1.2. I'm sorry: Move to remove Option 3B: Weighted Allocation Timeframe #2 from Section 3.1.1 in Draft Addendum I.

CHAIR BELL: Thank you, can I get a second? Does anybody want to second that? Yes, Sir, is that a second?

MR. KRIS KUHN: Yes, Kris Kuhn.

CHAIR BELL: Okay we have a second, good. We have a motion then, we had discussion of the motion.

MS. KERNS: Maya, that second was Kris Kuhn.

MR. BOYLE: Sorry to jump in also, Maya. My mistake in drafting the motion, 3.1.2.

CHAIR BELL: Okay, so we'll correct that. Thank you, Kris. Discussion of the motion. You all are kind of quiet. Well, we could vote on it if there is no further discussion. Emerson.

MR. EMERSON C. HASBROUCK: I agree with Joe, so I'm going to vote against this. I would not support this motion. I would support keeping it in the document, and let's see what the public has to say. Thank you.

CHAIR BELL: All right, would anyone like to speak the other direction? Yes, go ahead, Toni.

MS. KERNS: I just point out that if we do remove this option it takes us from 16 to 12 allocation options that the public would have to weigh.

CHAIR BELL: I think from the beginning we've been kind of having a plea for simplification, and I understand taking a large suite of things out, let them comment. But at some point, it does get a little overwhelming, I think. It's my opinion. All right, any other discussion? We can vote on this then.

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All right, all in favor of the motion, raise your hand. Oh, first of all, does anybody need to caucus? Yes, caucus. All right, we'll take three minutes. The magic three-minute timer, three-minute caucus. We've finished caucusing, good deal. All right, everybody ready? All in favor of the motion, just raise your hand, please.

MS. KERNS: I have Rhode Island, Massachusetts, Pennsylvania, Florida, Georgia, South Carolina, North Carolina, Virginia, PRFC, Maryland and New Hampshire. Did I miss anybody on this line?

CHAIR BELL: All opposed raise your hand.

MS. KERNS: I have Connecticut, New York, New Jersey, Delaware and Maine. Two abstentions, NOAA Fisheries and Fish and Fish and Wildlife Service.

CHAIR BELL: Two abstentions. That's 11 in favor, 5 opposed, 2 abstentions and no null votes. All right, it passes. Thank you. Yes, Megan.

MS. WARE: Just before we get off this section. I just wanted to provide one suggestion on tweaking wording, if that's okay. It was on 4B, the calculation procedure for the overage. There is a sentence that talks about overages to episodic and evaluating state landings on a weekly basis. I understand that we in the FMP report our episodic landings by week.

But in reality, we're reporting them by day, and I think a lot of the states are making decisions, not on a weekly basis, but on a day-by-day basis. For example, I don't assess, should Maine be an episodic in Week A, I assess, should Maine be an episodic on Monday versus Tuesday, versus Wednesday.

I was just going to recommend that we slightly tweak that wording, to consider each state's landings in day or days, but specifically each state's reported landings, because I know, and I'll clean this for Maine. We've had like a late report come in, and so that would be counted towards the overage in using that word reported. Does that make sense

what I'm suggesting? I'm seeing head nods. I realize it's really specific, but I just think it better captures where we're at.

CHAIR BELL: All right, I think that makes sense. Nichola.

MS. MESERVE: Just regarding the background information for this section. I think there is a mistake in the number of transfers that are reported occurring in each year. James, I think you mentioned it, with the FMP review there are 25 in 2021, and I don't think that is reflected in this document. Then with the background information for the episodic event set aside, that we're going to talk about next, I think the count is also off for Maine and Mass for the number of years that they have participated in the set aside. If you could just doublecheck those numbers before it goes out to public comment that would be great.

CHAIR BELL: Okay, thanks, Nichola. All right, anything else? Speaking of episodic set asides. That's what we'll move to next.

MR. BOYLE: Thanks for that, I'll doublecheck those. Moving on to the Episodic Event Set Aside Provision. The objective of the options in this section are to ensure sufficient access to episodic changes in regional availability, in order to minimize in-season disruptions, and reduce the need for quota transfers and incident catch or small-scale fisheries landings.

There are no changes to these options since the May Board meeting. As a reminder, Option 1 is to maintain the set aside at 1 percent of the coastwide TAC, the status quo, and then Option 2 would be to set the set aside at some value between 1 and 5 percent, with sub-options that would allow the Board to decide how the set aside could be adjusted, either as a static value during final action of this Addendum, or dynamically during specification proceedings.

Then I made a quick note that's just for clarification or for information. If the 0.5 percent fixed minimum was replaced by the three-tiered

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minimum allocation strategy, then the minimum allocated TAC would be reduced to 5.53 percent from 8 percent, like I mentioned before. That 2.47 percent freed up by selecting the three-tiered option, will be reallocated to the states.

But if you increase the EESA to 2.47 percent or less, then you would result in a similar value in terms of pounds of fish, being removed from the TAC prior to timeframe based allocation, prior to the Step 2 of allocation. That's all of this section as well. Thank you.

CHAIR BELL: All right, any questions? Any desire to mess with anything? Okay, I don't see any hands. All right, so we'll just hold what we've got. Good.

MR. BOYLE: Lastly, we have the incidental catch or small-scale fishery section, the objective of which, for these options, is to sufficiently constrain landings to achieve overall management goals of meeting the needs of existing fisheries, reducing discards, and indicating when landings can occur, and if those landings are part of the directed fishery.

In this section there are four subtopics to address incidental catch landings. For simplicity in this outline, I've only shown the non-status quo options. The topics include changing or proposed changes to the timing of when states can begin landing under the provision, permitted gear types, changes to the trip limit for those permitted gear types, and considering a new accountability system for incidental catch or small-scale fisheries landing.

To start with the timing of the provision, Option 1 is the status quo. Once a quota allocation is reached for a given state, the fishery moved to an incidental catch fishery. Currently, individual states can interpret that differently, so whether they consider it a sector or a gear type reaches their allocation, and they move into incidental catch, or whether the whole state reaches its allocation, and that whole state moves in incidental catch. Option 2 would unify it at sector, fishery or gear type allocation. Currently, states such as New Jersey and Virginia divide their state allocation into sector and gear

type specific allocations. This provision would confirm that once a sector or fishery or gear type specific allocation is reached for a state, then that sector or fishery or gear type fishery moves into the incidental catch provision.

Option 3 is the opposite. Once the entire quota allocation for a given state is reached, regardless of the sector or gear type allocation, then the menhaden fishery for that state moves into incidental catch for small scale fisheries. Section 2 is for permitted gear types. In the process of editing the options, the PDT discovered that fyke nets were mistakenly listed as both directed and non-directed gear in Amendment 3.

Additionally, in the May Board meeting the PDT was asked to review the classification of trammel nets, and consider redefining them as nondirected gear. In Options 2 and 3, which were drafted by the PDT, fyke nets and trammel nets are both reclassified as only nondirected gear. However, the status quo option must match Amendment 3.

Underneath the status quo option we created sub-options that would present the Board the chance to still choose the status quo provision, but change the classification of one or both of those gear types, if they so choose. Option 2, the incidental catch provision would apply to both small-scale directed gears and nondirected gears, but exclude purse seines.

This option is included due to the growth of directed landings from small scale purse seine gears in recent years. Landings from purse seine gears would count against a state's directed fishery quota. In Option 3, the incidental catch provision would apply only to nondirected gears. Under Amendment 3 this includes pound nets, anchor staked gillnets, drift gillnets, trawls, fishing weirs, fyke nets and floating fish traps, and we've added trammel nets to that as well. Section 3 is to modify trip limits.

Option 1 would maintain the status quo of 6,000 pounds per trip, or 12,000 pounds for two people for all permitted gear types. Options 2 and 3 would

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lower the limit for directed gear types only to 4,500 pounds or 3,000 pounds respectively. For both Options 2 and 3, the proposed change in the trip limit would only apply to small-scale directed gears.

Those gear types are listed in full in the document again, but as a reminder, it's cast nets, traps except floating fish traps, pots, haul seines, hook and line, bag nets, hoop nets, handlines, bait nets and purse seines, which are smaller than 150 fathoms long and 8 fathoms deep. Again, fyke and trammel nets have been removed from the directed gear category for Options 2 and 3.

Nondirected gear and stationary multispecies gears would still be able to land up to 6,000 pounds of menhaden per trip per day, with two individuals working from the same vessel, fishing stationary multispecies gear permitted to work together can land up to 12,000 pounds. Section 4, the catch accounting.

This section has changed significantly with comments from the Board at the May meeting. Option 1 is the status quo, where incidental catch or small-scale fisheries landings continue to not count against the TAC. In Option 2, total landings under this provision would be evaluated against the annual TAC, and then if those total landings exceed the TAC, the trigger is tripped, and the Board must take action as specified in Option 2A and 2B. Option 2A is for the Board to modify the trip limit for permitted gear types, and Option 2B is for the Board to modify permitted gear types.

Both 2A and 2B have a sub-option that would provide the Board a mechanism to make a change through Board action and not have to use adaptive management or create a management document. The PDT chose to draft the options in this way, and not to make a specific recommendation on whether the Board use Board action or adaptive management, because they felt it is a strictly Board decision to weigh the pros and cons of those two strategies for any given situation.

I'll also just throw in a couple of reminders here that with regard to these options, the first is the

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Board could always choose to use adaptive management, and create a new management document instead. Even if you have the power to use Board action, you do not have to use it. There is no sub-option for using adaptive management. Second, as in other sections of this document, the Board is not limited to the options as written here, and can make any combination within the scope of these options.

I would like to thank the PDT for all their hard work, especially for me, as I joined into the Commission in January, and I appreciate their help and patience in getting me up to speed in this process. Thanks a lot! Board actions to consider. Consider amending the language regarding overage paybacks, as I talked about earlier, and then consider approving Addendum 1 to Amendment 3 for public comment as modified today. That brings us to questions.

CHAIR BELL: All right, any questions about all of the language in there, the options available to us? Again, this is taking things out to public comment. Yes, Nichola.

MS. MESERVE: I had a question about Section 3.3.4, the catch accounting provisions. I appreciate the way that the PDT restructured Option 2. My question is whether adopting Option 2 there, which has a trigger mechanism for when the TAC is exceeded, would remove the language that is currently in the plan about the Board having the discretion if they see a nondirected gear directing, or the landings increasing significantly, even if the TAC isn't exceeded yet to ask for adaptive management, then.

MS. KERNS: Maya, can you throw up the trigger slide, which James will help me with which one it is. I just want to make sure I am reading.

MR. BOYLE: That's Slide 25, Maya, please.

CHAIR BELL: Conferring on that question.

MR. BOYLE: No, I don't think so. The wording here we believe, means that if the trigger is tripped the

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Board has to act, but does not preclude the Board from acting if it is not.

MS. MESERVE: Okay, thank you. I guess my hope then is that if the Board does pick something under Option 2, then that language that is already in the status quo about that the Board may act if they see nondirected directing, that that would be in the final document, based on the answer that you just provided.

CHAIR BELL: Okay, Lynn and Allison.

MS. FEGLEY: Just to recap Nichola's question and the answer. Regardless of whether or not the trigger is hit, the Board will have the discretion to make changes to that provision, based on how gears are performing, so that the gear is really increasing, we maintain that ability. Toni.

MS. KERNS: I guess, Nichola, the question would be. Well, what we described is true, but collectively we wouldn't know how you are performing in the middle of the year, and your trigger would get tripped at the end of the year. I don't know if the Board would be able to respond in the middle of the year to make that change. I don't know if that's what you're thinking or not. I just want to make sure.

MS. MESERVE: No, I wasn't thinking of that timely response. But if I use the last five years as an example, for four years we saw purse seines directing, and the landings increasing, increasing, and it was causing concern. We started the working group, and we had this process. It was only in 2021 that we actually exceeded the TAC. I don't want that ability for the Board to see that.

I think it's the normal adaptive management process, but it kind of spells it out in Amendment 3 now, like what the Board can consider, if they see a direction under the provision happening. Just maintaining that language there, I think provides the Board a little bit of guidance that even before the TAC may be exceeded, they can still act under adaptive management. Option 2 kind of adds to the Board's current ability, as opposed to replaces it.

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CHAIR BELL: Lynn, did we leave you hanging, or did it answer your question? Good, Allison, did you have a question as well?

MS. COLDEN: Yes, maybe just a clarifying question to jog my memory. Option 2 addressed a situation in which the TAC is exceeded when the IC/SSF landings are added. If there is another situation in which the TAC is exceeded, the overages are only accounted for on a state-by-state basis at this point for directed landings, is that correct?

MR. BOYLE: Yes.

MS. COLDEN: The reason why this is addressing just in the cases where the incidental catch landings exceed the TAC, is because otherwise it would be directed under the state landings. Just want to make sure I've got that correct.

CHAIR BELL: Toni.

MS. KERNS: There is episodic overages that get addressed through theirs, and that comes out of next year's episodic set aside, and then you have your directed landings for your directed state quotas, which come back out of your state which you're referencing.

MS. COLDEN: But basically, there are mechanisms depending upon where we see the overages.

MS. KERNS: That is correct.

MS. COLDEN: Yes, okay, just wanted to clarify, thank you.

CHAIR BELL: Other questions? Yes, Megan.

MS. WARE: If it's okay, I had just another wording suggestion. But I can hold that if you would like.

CHAIR BELL: Oh, yes Ma'am, go ahead.

MS. WARE: I realize it's not necessarily a question. I guess under the trip limits and the gear types there were sub-goals, I'll call them that were under each section. I'm wondering if we can just add the

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word consider to those goals, because I think as they are currently written, they are actually narrower than the scope of options in the document. For example, for the trip limit one it would be, limit the annual volume of IC/SSF landings by considering reductions to the trip limit.

MR. BOYLE: Yes, okay. Thank you.

CHAIR BELL: Is that it? Thanks. Any other comments, questions, suggestions, tweaks? I don't see any up here yet. Chris. Who is that?

MS. KERNS: Before we go to the public, can I ask the Board a question about the staff recommendation to the payback provision? We figured this out after the PDT had met, so the PDT did not see this recommendation. When James and I were thinking about it, I was like, I guess we could just add another year.

But in further consideration as I've thought, I think that if the Board agrees that it is good to move it back, that payback should only come in a single year, we shouldn't spread it out over a two-year timeframe. I am suggesting that the option just be two years later. For example, if we find out that there was an overage in 2021, it would come out of quotas in 2023. I just want to make sure the Board is okay with adding that language to the document.

CHAIR BELL: Yes, Nichola.

MS. MESERVE: I'll admit I haven't had long to think about this, other than today. But I don't like that there is additional lag if it's not needed, in accounting for overages. I guess my question is really whether this has been an issue for any states that have had overages, and having to account for them in the subsequent year, to know if this is really a necessary change that we need to make right now and add it to the document.

CHAIR BELL: Yes, Megan.

MS. WARE: I think to respond to that, Nichola. For example, we've had situations where incidental landings have changed slightly from April 1st to May

1st. I think in one of the weighted options, if total landings were over the TAC, those would then be used to reduce our quota in the subsequent year, and I'll look to staff to confirm that. I think we may not have a final number on those at the end of the existing fishing year, if I am understanding the option correctly, unless that is already lagged. It's already lagged. Then I think it would be okay.

MS. KERNS: Trying to remember the language from that weighted option, Megan, hold on.

CHAIR BELL: We'll answer that, and then I'll get to you, Joe.

MS. KERNS: It's lagged, and it's spelled out specifically to two years, which overage payback is not spelled out that way. Does that help, Nichola?

MS. MESERVE: I don't know, is this consideration being added because of the moving average option, or this is a distinct issue that the PRT came up with, staff realized, and just looking to add it here? From a Massachusetts state perspective, we have a good enough sense to handle any overage that we have in the immediate year.

From my standpoint, I'm not seeing a need to add this. But if it's helpful to other states I would be willing to consider it. Just I don't want to complicate the document with an option that we don't need, if no one around the table things we need to address overages two years later, as opposed to one year later.

MS. KERNS: I can help clarify where James and I ran into this issue. As we were trying to figure out the validated data and kept going back and forth with a couple of different states on the issue. We realized that a, Jeff tells me to never say data is final, but a good value for that fishing year is often not going to come until sometime in the summer.

There are states that divide their quota up by quarters, by gear types at the beginning of the season. One gear type may have already had their run. They wouldn't be able to take a quota overage out of that gear type, and wouldn't be able to

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address the overage in that year, and so it would have to come out of their next year's quota, in order to get it out, once we told them that they had an overage. Because they would have already allocated out to their fishery. That's why we had made the suggestion.

CHAIR BELL: Okay, so there is utility in leaving that in. Joe, you had a question?

MR. CIMINO: Actually, I was just going to ask Toni to do what she just did, but it wouldn't be leaving it in, it would be adding language. Is that also, correct? Yes. Nichola, we would be one of those states that Toni just created that scenario. You know we have vessels that harvest a great amount at one time, and if one of those was missed and that overage needed to come out in the next year. But we didn't know that until sometime during the year. It would impact all the allocations for all the other fisheries.

CHAIR BELL: Yes, that was leaving it in in the context of the draft where we are right now.

MR. BOYLE: I would also just like to add really quickly that the way we're going to draft the language it wouldn't stop a state from paying an overage if they could in the subsequent year, like in the original, the year after the overage.

MS. KERNS: I just suggested that we only do one year for accounting purposes, sorry. That was what I was getting at, where I was correcting, because I think accounting purposes it would be maybe a bit of a nightmare if we had it spread over two. Yes, it's my fault.

CHAIR BELL: Anything else? Yes, Allison.

MS. COLDEN: I just wanted to sort of agree and reiterate Nichola's point. If there is no need for a lag, especially for a species like menhaden, which we're managing on an ecosystem context. I would hope that we could make those changes, and respond to those overages as quickly as possible.

I'm not quite sure why whatever we're discussing today would be different than how we've dealt with directed landings overages since Amendment 3. I don't know if I'm just not following the issue here, because we have had overages, but is it that they've always been covered, so we haven't dealt with this yet? I'm not sure what is different, thank you.

CHAIR BELL: Toni.

MS. KERNS: We have not had any overages, but I anticipate we are going to start getting very close to our quotas as we change these allocations, and there could be overages. Because of the difficulties we had in getting a version of final landings this year, I realized that this would become a problem in the future if we had overages.

CHAIR BELL: It's just thinking ahead and changing the field. Okay. Anything else? We have a draft motion we could put up on the board. Hang on, Jim Gilmore.

MR. JAMES J. GILMORE: Sorry, my energy level has dropped below most of what is in the room right now. This goes to Section 3.3.2, which we had raised the issue at the last meeting, and it had to do with the IC/SSF and particularly the small-scale fishery. In that scenario that I raised at the last meeting.

New York's fishery really is a beach seine fishery now. That is what we catch 85 percent of the fishery is prosecuted with a beach seine. I raised a point that under Option 3 under 3.3.2, if you chose that option, you would eliminate New York's fishery, essentially. We've already banned purse seines, the Legislature did that. We have the ultimate small-scale fishery. We're catching everything with a beach seine. We had made a request that the PDT essentially fix that, and one suggestion was to add it in as an exemption under Option 3, and it would be considered under a nondirected fishery, even though technically it wasn't. I think the response that the PDT came back with was, and if I can raise it. At the spring meeting the PDT requested to review Option 3, and consider creating an exception for beach seines to

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continue operating if this option is selected. However, given that Options 1 and 2 both allow for beach seines to continue under the IC/SSF provision, so I agree, if we pick one of those options, we don't have a problem.

However, Option 3, the intent was to create a provision where there was no menhaden-directed fishery. Such an exception would be contrary to the spirit of the option, and essentially did not have a directed fishery. I tend to agree with that. But the spirit of it was not to eliminate a state's fishery. It essentially goes on to say that since because of that that we didn't want to have a directed fishery, that the PDT chose not to modify the option.

Right now, I'm looking at this, and if the PDT can't fix it, we've got two things that New York can do. Either eliminate Option 3, which I know may give some folks some Ajita, or I have a motion ready to put up to maybe consider adding beach seines in under Option 3, so that it could be considered if that option is selected. If you would like me to, Mr. Chairman, I would go ahead with that motion.

CHAIR BELL: Toni.

MS. KERNS: Jim, go ahead with your motion. I just would point out that New York is not the only state with a fishery that gets eliminated by Option 3. There are other state fisheries that do get eliminated, and the PDT was following the direction of the Board to eliminate these directed fisheries as requested, and so that is why they had the response. Some other fisheries were also eliminated by that option. It's not just New York.

MR. GILMORE: Okay, so is there a different solution to it then, Toni? That again was the intent was not to, we're talking about small-scale fisheries, and it was trying to restrict harvest so that we wouldn't. I mean the whole intent of that section was that we would not exceed harvest. But now we're eliminating valid harvest.

Maybe there is a different way to go about doing this, because all I was going to do in the motion was to add on essentially, it was essentially Option 3,

and change the language to nondirected and beach seines only. That would fix my problem, but is that going to cause other problems for other states?

MS. KERNS: I will leave that to the Board's discretion. I'm just telling you what the PDT was directed to do, and therefore that was their rationale.

CHAIR BELL: Allison, to that.

MS. COLDEN: Just a clarifying question. Wouldn't removing it as a gear under the incidental catch provision simply move those landings to directed landings? I'm not sure I understand how it would end the fishery. It would just change the pot under which it's accounted for.

CHAIR BELL: Go ahead, Jim.

MR. GILMORE: I'm not sure. If the quota increases, yes. I don't think it's going to be an issue. But if it doesn't, and that's what we don't know right now, then it could be an issue, because if we go over our directed fishery quota, then essentially, we would be into the incidental catch section, and then we may come up short.

CHAIR BELL: Yes, Lynn.

MS. FEGLEY: I do understand the concern here, but I just want to take everybody back to the objective of this Addendum, which is one, to align with the availability of the resource, and two, to enable states to maintain current directed fisheries with minimal interruption during the season. I think, looking at the tables. It looks like you guys are harvesting 300,000 pounds, and one year you maybe have 800,000 pounds.

I think we would be better off, rather than trying to craft an exception to a very specific piece, to really consider when we're finalizing this document. This is the sort of thing that we need to consider. It's not that much fish. I mean I would hope that we could figure out a way that your directed fishery isn't eliminated, because that's directly counter to

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one of the goals of the Addendum. I don't know if that helps, but I just wanted to flag that.

MR. GILMORE: Let me ask Toni a question then. The PDT response was something to the affect that we would create some kind of a loophole. That I didn't quite understand where the loophole was coming in that all these states are going to come out of the woodwork now and start having big beach seine fisheries, which if anybody has ever tried to catch menhaden with a beach seine, it's not the most efficient way of doing it. What is the loophole, if anybody knows, from the PDT?

MS. KERNS: I'm going to go to one of our PDT members in the back of the room and ask her to come to the table, unless James remembers, but Nicole. I'm phoning a friend.

MS. NICOLE LENGYEL COSTA: Thanks, Toni. Yes, you are correct, Mr. Gilmore. The concern from the PDT was that other states could then develop beach seine fisheries. We did have a conversation about it. We do recognize it is small scale. It is not the most effective method, as you said.

But it still would open that door for the opportunity, and we just felt that beach seines being a directed gear, we didn't feel it was appropriate to move it into the nondirected gear. We would be open to other suggestions of how to address the issue, but we just felt it was really a directed gear, so it didn't belong in the nondirected gear category.

CHAIR BELL: Okay.

MR. GILMORE: Let me try a motion, and maybe that will help out.

CHAIR BELL: Why not?

MR. GILMORE: I've got two different versions of this, but I'll try Emerson's suggestions first, because the other one was going to be, for any state that's got a beach seine fishery that hasn't banned purse seines, but I'll try a simpler way. **Move to modify Section 3.3.2, Option 3, nondirected and states**

with existing beach seine fisheries. Put it up there and let me wordsmith it a bit.

MS. KERNS: Jim, we're going to probably need you to, let's see what Maya gets. Then s-l-o-w-l-y.

MR. GILMORE: Sure, I will slow down. Okay, 3.3.2 nondirected, move to modify Section 3.3.2, Option 3 to read, nondirected and beach seines. Give me a second, Maya. And states with existing beach seine fisheries.

CHAIR BELL: That's good enough for you, can I get a second to that from someone? Okay, Tom had his hand up. Okay Tom first.

MR. FOTE: I'm trying to get the term straight in my mind. When I look, because there is a haul seine, and a haul seine is the same as a beach seine, because the haul seines are a very efficient way of harvesting. I mean think what North Carolina did on striped bass back in the seventies, and we think that's why New York eliminated the haul seine for striped bass before it was done, because it could basically see a large area.

I mean I used to drive to beaches out in Montauk, and basically watch the haul seines load up pickup trucks with striped bass, and also it was basically kind of destructive about the fishery. It had a lot of bycatches of other fish, and once you dragged them on the beach, you weren't basically releasing them alive. I'm a little confused here, so I want to know how it operates.

CHAIR BELL: That wasn't a second from you then, that was just a question about gear type, because what you're describing haul seine, yes that is in my mind a different gear from probably a beach seine, I think. Yes, Joe.

MR. CIMINO: You have a motion on the table, so I will second for discussion, and then we can get to Tom's question.

CHAIR BELL: Joe seconds that, now we'll have some discussion. Jim.

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MR. GILMORE: Yes, actually, as Emerson and I were just looking at it. It might be easier to leave the heading alone, and just add on at the end, you know the last thing with the states with existing beach seine fisheries. Let me change, do you want to try it, Toni?

MS. KERNS: Jim, I'm not sure it should say states with existing beach seine, it should just existing beach seine fisheries. You would just add to the gear list existing beach seine fisheries. Maya, we will friendly amend. Move to modify Section 3.3.2 Option 3 to add or by adding, and then take out parentheses, nondirected. Exactly, thank you, Maya.

CHAIR BELL: Okay, Jim, is that good, as far as modifying wording. Joe seconded.

MR. GILMORE: I think, yes Joe has the second, not Tom.

CHAIR BELL: Okay then, discussion of the motion. Nichola and then Emerson, and then Megan.

MS. MESERVE: I am going to oppose the motion. I agree with the PDTs rationale that this is counter to the intent of the option. I understand New York's situation, I believe, but think that this option has to be taken in consideration of the other options that look at quota reallocation. I'm sure we could all find one option that we don't like on its own. But you have to think about this in the context of what else the Addendum may do. I'm going to oppose this.

CHAIR BELL: All right, Emerson.

MR. HASBROUCK: Obviously I support this motion. Under some of the goals that we have in this document, one of which is to maintain current direct fisheries. It doesn't say if they're large scale directed fisheries or small scale directed fisheries, but to maintain those fisheries. That is under the allocation section.

We don't know at this point in time where we're going to end up with allocation, and that is some of

the issue in New York is that we really don't have sufficient allocation, because menhaden landings weren't really tracked until just recently in New York. If we knew where we were going with allocation, we may not need this.

But since we don't know where we're going with allocation, I think we're going to need this. Another goal was to meet the needs of existing fisheries, and as Jim said, in New York the fishery is a beach seine fishery. That is what it is. You know they really depend on that bycatch allocation. To answer Tom's question.

The beach seine is different from the haul seine, and the fishery is also executed in an area and in a method where there is essentially hardly any, if any, bycatch, including striped bass. I know the people who are involved in this fishery. I've had discussions with them several times about bycatch, and it's almost nonexistent. This is a totally different fishery than the haul seine fishery for striped bass that used to occur in New York.

CHAIR BELL: To that Tom, just really quickly.

MR. FOTE: Yes, I'm trying to figure out how is it different if you basically are taking a boat and launching it from the beach, and then wrapping it around or is that the way it's being done, because that is a haul seine. I'm trying to figure out, and what areas are they doing this in? That's all I'm asking the question before I vote.

CHAIR BELL: All right, Emerson.

MR. HASBROUCK: It's up in Flanders Bay and Peconic Bay. It's an area where there was never a striped bass haul seine fishery. This is not occurring along the south shore ocean beaches.

CHAIR BELL: Okay, thank you. Megan.

MS. WARE: I mean I think I can confidently say I probably best understand people's concerns about reliance on small scale, given where Maine is right now, and I certainly get New York's angst about where Option 3 could go. But respectfully, both

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Options 2 and 3 are threatening Maine's small-scale fishery, which we've become completely reliant on, given our quota. I'm just getting a little nervous here that we're starting to carve out exemptions for certain gear types over others. I think how the options are listed right now is appropriate, and I think we should keep them that way.

CHAIR BELL: Chris, and then Cheri.

MR. BATSAVAGE: Yes, I think just confusion and specificity of the definition of a beach seine makes this problematic when you look across states. I appreciate the definition of how the beach seine is being fished in New York, but the way this is written, the beach seine would be fished much differently in North Carolina, and possibly other states.

Then if you get any gear changes that are still called a beach seine, you know it can then kind of snowball on top of there. I mean I understand New York's dilemma, but I think just the unintended consequences of this makes me reluctant to support this motion.

CHAIR BELL: Okay, Cheri.

MS. PATTERSON: Yes, I think this kind of, I completely sympathize with New York. I know that this is going to likely affect us also in New Hampshire. But I think it goes against what the option is indicating. It's indicating nondirected gears, and this sounds like a directed gear. That is where I'm a little confused about why we're adding something that's directing, when it's under a nondirected gear revision.

CHAIR BELL: Jim.

MR. GILMORE: Yes, and both Cheri and Chris. You are 100 percent right, it's a directed gear. From a technical standpoint I will not argue that. From a practical standpoint, it's essentially a fishery that if I go back two years ago, before our Legislature banned purse seines, I would have other gears that I might be able to prosecute the fishery.

But I don't. We're down to, the intent of that legislation was to preserve the menhaden fishery in New York, and keep a population high, so we're restricted to the smallest gear possible. Now it's created this dilemma, because of the name. But let me put a couple of more points in here before we vote. The concern, and it's in the Addendum, is that we want to prevent fish kills. Each year for the last couple of years, we've run through our directed fishery quota and we've gone to this small-scale fishery using beach seines to keep fish kills from happening. Fish kills that, trust me I've had town supervisors at meetings and I said, the fish are alive in the water, I can catch them. They are my problem. They die and they are on the beach they are your problems. They've been spending hundreds of thousands of dollars taking these fish off the beach. That is our bigger concern about it. Yes, if our quota goes up and everything, it's not going to be an issue. If it stays the same, then I get to the fall. I've got menhaden kills all over the Peconic's.

We've got fish not going to market, just essentially going to a landfill. The guys that are doing this, and it's one guy with a group of people now, are catching that fish, Megan, and they're going to Maine. That is where they are selling them for the lobster fishery. This is a practical management right now.

I understand getting into yes, it's not directed fisheries. But we're trying to get something that maintains the fishery, and essentially prevents some of the other issues like fish kills and loss of a resource or waste of a resource. Again, we need something better than what's in there right now. Thank you.

CHAIR BELL: Okay, any other discussion on this really quickly? Max.

MR. MAX APPELMAN: Yes, I just want to raise a technical point, maybe, a concern about inconsistent terminology. I mean we're hearing haul seine, beach seine. It's the first time that beach seine is even entering this document, and so if we want to keep things, avoid any confusion, and

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if this is a haul seine, as what's been described here in the small-scale directed gears, maybe we should be talking about haul seines. I'm being confused between beach versus haul seine, and if I'm being confused maybe some others are getting confused too.

CHAIR BELL: Thanks, Max. Let's go ahead and vote on this. All right, there is the motion. Do you need to caucus? Yes, probably so. Let's take three-minute caucus. Maya, can you hit the timer? I guess that's three minutes, folks. Everybody finished caucusing? Yes, Jim.

MR. GILMORE: Just a suggestion, because of consistency in the document. We've been calling it a beach seine, which is not in the document. But we have haul seine that is in the document, and if they are synonymous, because we changed the word.

MS. KERNS: They are not the same. A haul seine is not a beach seine.

MR. GILMORE: No, I agree with you. But we don't have beach seine anywhere else in the document. We probably could have a good coffee discussion or a drinking discussion about a haul seine and a beach seine, what the difference are. But anyway, all right, we'll leave it alone.

CHAIR BELL: Max, do you have something to that?

MR. APPELMAN: I don't mean to open up a can of worms, but with all due respect, the small-scale directed gears identified in the document does not include beach seine, so how if we're saying they are different gear types, how is it that a state is using beach seines under the small-scale directed fishery provision? I mean I think the discussion is that they are essentially synonymous. We're calling them the same thing. That is where this concern is coming from.

CHAIR BELL: All right, I think we've had plenty of discussion on this, and plenty of gear confusion a little bit. Let's go ahead and vote then. See the

motion to modify the wording in 3.3.2. All in favor of that motion, please raise your hand.

MS. KERNS: I have New York.

CHAIR BELL: All right, all opposed to that motion, please raise your hand.

MS. KERNS: I have Rhode Island, Massachusetts, Connecticut, Pennsylvania, Florida, Georgia, South Carolina, North Carolina, Virginia, Potomac River Fisheries Commission, Maryland, Delaware, Maine and New Hampshire.

CHAIR BELL: All right, any abstentions? Two abstentions.

MS. KERNS: NOAA Fisheries and Fish and Wildlife Service.

CHAIR BELL: Any nulls?

MS. KERNS: New Jersey.

CHAIR BELL: One null, all right. What is the final score there, 1 for, 14 opposed, 2 abstentions and 1 null? All right, so the motion does not pass. I guess we're back. We have a Draft, right? We could put a motion to approve this Draft to move forward, get that up there. Is that a Maya thing? Would anyone care to make this motion to approve? Okay, I saw Megan's hand first. Megan.

MS. WARE: Sure, move to approve Draft Addendum I for public comment as amended today.

CHAIR BELL: All right, a second, Cheri. Just got a second from Cheri. See if we can do it this way. Any opposition to the motion? Thank you, she's holding me to this. Before we vote, I think we have a member of the public that would like to comment, so we will take a public comment on this right now before we vote.

MR. SHAUN GEHAN: Thank you, Mr. Chairman, Members of the Board. This will be quick. My name is Shaun Gehan, I work with Omega Protein

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and will be doing comments on this. It's just a question about what specifically may be within the range of options in the document that could be selected.

The question is whether the way the document is laid out is, advocating for allocations based strictly on current and/or current and historic use within the range of options. That would be either without any minimum allocation to the states, or no minimum allocation and no episodic even set aside. Is that just purely done on the basis of current and/or current historic landings within the range of options?

CHAIR BELL: Did you get the question?

MS. KERNS: Shaun, I don't think so. The only thing that the Board can choose from are within the current range of options that are in the document itself. The document does state that the Board has the prerogative to cross options, but it has to be within the current range of options of the document.

MR. GEHAN: Okay, thanks. Just wanted clarification.

CHAIR BELL: Okay, thank you for that question, Shaun. All right, okay now, are there any objections to this motion to adopt the Draft document? We have one objection.

MS. KERNS: Note who that objection is. New York objects.

CHAIR BELL: Yes, so just one. Okay, we're good, then that carries. Motion passes, woo, on to public comment.

MS. KERNS: Maya, motion carries with one objection, and then you can put in parentheses, New York. Thank you.

CHAIR BELL: What have we got left? Yes, is Tina going to do that, are you doing that?

MS. TINA L. BERGER: I'm here.

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REVIEW AND POPULATE ADVISORY PANEL

CHAIR BELL: We were just talking about you. Yes, the last agenda item we have is an Advisory Panel Appointment, so Tina, do you want to do that?

MS. BERGER: Be happy to. Members of the Board, I have for your review and consideration and approval the nomination of Barbara Garrity-Blake from Gloucester, North Carolina. Her nomination form was in your main meeting packet. That's it.

CHAIR BELL: Thank you, Tina. Yes, Chris.

MR. BATSAVAGE: Yes, I'll move to approve the nomination of Barbara Garrity-Blake from North Carolina to the Atlantic Menhaden Advisory Panel.

CHAIR BELL: All right, Pat, are you seconding? Pat seconds. All right, any objection to the motion? **I don't see any objection. The motion carries.** All right, thank you and thank you, Tina. Wow, I guess that's it. All right, any other business to come before the Menhaden Board?

MS. BERGER: Toni, could you tell us who the seconder was.

CHAIR BELL: Pat Geer.

MS. BERGER: Thank you.

ADJOURNMENT

CHAIR BELL: I got us finishing on time then. All right, well done, folks. Thank you very much. We are adjourned then.

(Whereupon the meeting adjourned at 4:55 p.m. on
Wednesday, August 3, 2022)



Atlantic States Marine Fisheries Commission

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MEMORANDUM

TO: Atlantic Menhaden Management Board

FROM: James Boyle, FMP Coordinator

DATE: October 21, 2022

SUBJECT: Public Comment Summary on Addendum I to Amendment 3

The following is an overview of all comments received by ASMFC on Addendum I to Amendment 3 to the Atlantic Menhaden Fishery Management Plan as of September 30, 2022 (closing deadline).

A total of 121 comments were received on Draft Addendum I from individual comments, organizations, and form letters. A total of 8 organizations submitted comments; one organization's letter also listed 14 supporting organization signatories, and another's had one signatory. A total of 34 comments were received through 3 form letters¹. The remainder of comments (64) came from individual comments including from private anglers, charter captains, commercial fishermen, and concerned citizens.

10 public hearings were held for 11 jurisdictions from September 7-September 27, 2022. 2 hearings were conducted via webinar only: Rhode Island and New Jersey. 6 public hearings were conducted in-person: Maine (Augusta), Maine (Brewer), Massachusetts, New York, Virginia, and North Carolina. 2 hearings were conducted in a hybrid format with attendees participating via webinar and in-person: New Hampshire and Delaware-Maryland-Potomac River Fisheries Commission.

246 individuals (not including state staff, ASMFC staff, or Commissioners/Proxies) attended the hearings and some of these individuals attended multiple hearings. Live polls or a show-of-hands vote were used at most hearings for some of the proposed options; the tables indicate when a poll or vote was used.

The following pages include comment tables summarizing written and hearing comments for each option proposed in Addendum I. There is also a list of other topics/themes commonly raised in the comments. The summary tables are followed by the letters and emails sent by organizations, form letters with total submissions count, and individual comment letters and

¹ Form letters (more than 3 of the same comment) include comments stating support for an organization's comments; however, if the commenter provided additional comments/rationale related to management beyond the organization's or letter's comments, then it was considered an individual comment.

emails. The public hearing summaries and attendee lists are provided as a separate attachment included in the 2022 Annual Atlantic Menhaden Board main meeting materials.

Public Comment Summary Tables

Table 0. Comment Count

Number of written comments received by individuals, organizations, and form letters, and number of people who attended and participated in the polls/provided comments for each public hearing

Written Public Comments Received		
Individual Comments		64
Form Letters		34 [^]
Organizations		8
Org/Business Signatories ⁺		15
<i>TOTAL</i>		121
Public Hearing	# Public Attendees *	# Poll Participants/ Commenters **
Maine (Augusta)	72	72
Maine (Brewer)	57	57
New Hampshire	11	5
Massachusetts	24	5
Rhode Island	8	7
New York	11	4
New Jersey	5	5
Delaware-Maryland-PRFC	21	8
Virginia	54	54
North Carolina	0	0
<i>TOTAL</i>	<i>261*</i>	<i>217</i>

[^]3 different form letters received.

⁺One organization’s letter also listed 14 supporting organization signatories, which are categorized as Signatories (subset of Organizations). Another organization listed 1 signatory.

*Some people attended multiple hearings. Public attendees do not include state staff, ASMFC staff, or Commissioners/Proxies.

** Some individuals and organizations participated in polls at multiple hearings and/or provided verbal comments at multiple hearings.

Commercial Allocation

Section 3.1

Table 1. Step 1: Fixed Minimum

Number in support for fixed minimum options

	Option A: Status Quo	Option B: Three-Tier
Individual	3	13
Organization	18	4
Form Letter	18	12
Hearings	*	*
ME		
NH	1	2
MA		
RI		2
CT		
NY		
NJ	2	
DE/MD/PRFC	1	5
VA	2	46
NC		
FL		
TOTAL	45	84

**Poll/show of hands conducted at hearings except for MA and NY hearings.*

Most comments favored Option B to use a three-tiered minimum system. Many of the comments in support of Option B expressed concern that giving quota to states that do not use it reduces the quota to states with a greater economic reliance on the menhaden fishery.

Comments in support of Option A often felt that it was most equitable to assign the minimums equally and wanted states with smaller or no menhaden fishery to have a greater ability to reserve quota for other ecological purposes.

Table 2. Step 2: Timeframes
Number in support for timeframe options

	Option 1	Option 2	Option 3A (No Sub-Option specified)	Option 3A: Sub-Option 1	Option 3A: Sub-Option 2	Option 4 (No Sub-Option)	Option 4A	Option 4B
Individual		8				1	7	4
Organization		18			4		2	
Form Letter		22					12	
Hearings	*	*	*	*	*	*	*	*
ME	3	107				8		
NH		1						2
MA								
RI		3						1
CT								
NY		4						
NJ	1	1	1		2			
DE/MD/PRFC		2	1		1		1	1
VA		1			53			
NC								
FL								
TOTAL	4	167	2	0	60	9	22	8

**Poll/shows of hands conducted at hearings except for MA and NY hearings.*

Most comments favored Option 2 to use landings from 2018, 2019, and 2021 as the basis for distributing the TAC. There were also a number of individual comments that called for an increase or to maximize quota to Maine, often citing the economic impacts of bait costs on the lobster industry, but did not choose a specific option. Comments in support of Option 2 often referred to increased availability in the northeast and a desire for quotas to align more closely with that availability. A number of commenters who prefer Option 2 also gave a secondary preference for Option 3A Sub-option 1, which would use historical and recent landings while giving recent landings greater weight.

Comments in support of Option 3A Sub-option 2 often said that it is more equitable to weight historic landings equally with recent landings to benefit long-standing fisheries.

Comments in support of the various options within Option 4 expressed largely similar views to supporters of Option 2 by citing a desire for quota distribution to align with the changing fishery.

Other Comments Related to Allocation

A number of commenters expressed concern over the distribution of coastwide quota, particularly the concentration in the reduction fishery.

Many commenters believe that menhaden caught in Maine are larger than those caught farther south, which would cause the quota to be used with fewer fish, and caused concern that other states are fishing for juveniles, thereby hurting the spawning stock.

Episodic Event Set Aside

Section 3.2.1

Table 3. Percentage of EESA
Number in support for EESA options

	Option 1	Option 2 (No sub-option specified)	Option 2 Sub-Option 1	Option 2 Sub-Option 2
Individual	1	11	3	3
Organization	3	1	16	1
Form Letter		12	18	
Hearings	*	*	*	*
ME		129		
NH	1		1	2
MA				
RI	1	1	3	1
CT				
NY				
NJ	3		1	
DE/MD/PRFC				
VA	53	1		
NC				
FL				
TOTAL	62	155	42	7

**Poll/show of hands conducted at hearings except for MA and NY hearings.*

Most comments were in favor of Option 2, although the vast majority did not specify a sub-option. Of the supporters that chose a sub-option, most supported Option 1 for the Board to set the new EESA percentage statically at the annual meeting. Many comments in support of a version of Option 2 also expressed support for the increase to be to the maximum 5%.

Incidental Catch/Small-Scale Fisheries
Section 3.3

Table 4. IC/SSF Timing
Number in support of Timing options

	Option 1	Option 2	Option 3
Individual	7		3
Organization	2	2	
Form Letter	12		
Hearings	*	*	*
ME			
NH	1		2
MA			1
RI	2		2
CT			
NY			
NJ	2	0	2
DE/MD/PRFC	2	4	1
VA		1	
NC			
FL			
TOTAL	28	7	11

**Poll/show of hands conducted at hearings except for MA and NY hearings.*

Most comments supported Option 1, although it is notable that Option 2 achieves the same goal of maintaining the ability for states to divide their quota by sector and for sectors to enter the IC/SSF at different times. Supporters of the current system frequently cited the benefits of flexibility for different states, and some referred to the success of the sector divisions in New Jersey and Virginia.

Supporters of Option 3 frequently expressed concern that the system can be manipulated to get fisheries into the IC/SSF provision earlier in the fishing season.

Table 5. IC/SSF Gear Types
Number in support for Gear Type options

NOTE: For clarity, the sub-options of Option 1 were not the focus of the public hearing presentations and received few public comments.

	Option 1 (No sub-option)	Option 2	Option 3
Individual	40		2
Organization	3	2	16
Form Letter	12	4	18
Hearings	*	*	*
ME	129		
NH		1	2
MA			
RI			3
CT			
NY		4	
NJ	1	2	1
DE/MD/PRFC	2	4	2
VA		1	
NC			
FL			
TOTAL	187	18	44

**Poll/show of hands conducted at hearings except for MA and NY hearings.*

Most comments favored Option 1 to maintain the current permitted gear types. The primary concern for many commenters was the inability of other gears, particularly gillnets if those were to become the dominant gear, to release non-target species and menhaden over the trip limit alive. Along with the bycatch mortality, commenters cited the economic and physical toll of removing purse seines, as they felt gillnets were less efficient and harder on fishing crews.

Opponents to Option 1 frequently commented that purse seines are a directed gear and felt that they do not conform to the goals of the IC/SSF provision.

Table 6. IC/SSF Trip Limits
 Number in support for IC/SSF Trip Limit options

	Option 1	Option 2	Option 3
Individual	17		2
Organization	4		16
Form Letter	16		18
Hearings			
ME	57		
NH	2		2
MA			
RI	1		3
CT			
NY	4		
NJ		1	2
DE/MD/PRFC	2	2	4
VA			
NC			
FL			
TOTAL	103	3	47

**Poll/show of hands conducted at hearings except for MA and NY hearings.*

The majority of commenters favored the status quo for directed gear trip limits, often citing the relatively small percentage of IC/SSF landings compared to directed landings, and believing that lowering the trip limit would make the IC/SSF fishery economically unviable, thereby enhancing the burden on small fishers.

Table 7. IC/SSF Catch Accounting
 Number in support for IC/SSF Catch Accounting options

	Option 1	Option 2 (No sub-option)	Option 2A	Option 2B	Both 2A and 2B
Individual	7	3			
Organization		17			1
Form Letter	12	18			
Hearings					
ME	57				
NH	1		2		2
MA					
RI	2		3	1	1
CT					
NY					
NJ	2		1		1
DE/MD/PRFC	2		1	1	2
VA		2			
NC					
FL					
TOTAL	83	40	7	2	7

**Poll/show of hands conducted at hearings except for MA and NY hearings.*

Most comments supported the continuation of not counting the IC/SSF landings against the TAC. Similar to other sections of this provision, some commenters believe the IC/SSF to be a small percentage of the overall landings and that imposing limits on it puts an undue burden on small fishers.

When counted together, all of the versions of Option 2 represent a significant minority, who largely expressed the view that IC/SSF landings should be counted equally to directed landings to limit the overall use of the provision.

Other Comments Related to the IC/SSF Provision

Some commenters did not choose specific options, but expressed concern that without more restrictive limits on menhaden fishing, the stock will follow the same decline as was seen in Atlantic herring. Additionally, many commenters were concerned about the level of IC/SSF landings in Maine and the potential for those landings to lead to a greater increase in quota relative to other states.

ADDITIONAL TOPICS RAISED IN PUBLIC COMMENTS

In addition to comments on the specific options, the following topics/themes were commonly raised by commenters. Due to the breadth of comments, this overview does not represent the entirety of topics addressed in the comments.

Additional common themes/topic raised during the hearings included:

- Concern about menhaden harvest in sensitive areas, such as Chesapeake Bay and Boston Harbor
- Concern for the concentration of menhaden fishing boats in certain areas of ME and the decrease in bird and mammal activity that is seen afterwards
- Concern about the complexity of Addendum I

Comments were submitted by the following groups and organizations:

Theodore Roosevelt Conservation Partnership	Virginia Saltwater Sportfishing Association
National Audubon Society	Wellfleet Natural Resources Advisory Board
National Wildlife Federation	Riverkeeper, Inc.,
Marine Retailers Association of the Americas	Stellwagen Bank Charter Boat Association
International Game Fish Association	Chesapeake Bay Foundation
American Sportfishing Association	Reedville Bait
Wild Oceans	Lund's Fisheries Inc.
Bonefish Tarpon Trust	Omega Protein
Menhaden Defenders	Ocean Harvesters
Great Egg Harbor Watershed Association	Maine Coast Fishermen's Association
Gotham Whale	Regal Marine Products, Inc.,
The Rhode Island Saltwater Anglers Association	Maine Lobstermen's Association

Comments were submitted via the following form letters:

L&L Wholesale Bait (4)

Form Letters from unknown sources:

Form Letter 1 (18)

Form Letter 2 (12 ME fishers)



CHESAPEAKE BAY FOUNDATION
Saving a National Treasure

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Bishop Eugene Taylor Sutton

Alan L. Wurtzel

September 30, 2022

James Boyle
Fishery Management Plan Coordinator
Atlantic States Marine Fisheries Commission
1050 N. Highland Street, Suite 200A-N
Arlington, VA 22201

RE: Comments on Draft Addendum I To Amendment 3 of the Atlantic Menhaden
Interstate Fishery Management Plan

Submitted via email to: comments@asmfc.org

Dear Mr. Boyle:

On behalf of the Chesapeake Bay Foundation (CBF), I wish to provide the following comments on the Atlantic States Marine Fisheries Commission's (ASMFC) Draft Addendum I to the Interstate Fishery Management Plan (FMP) for Atlantic Menhaden. CBF is the largest conservation organization dedicated solely to saving the Chesapeake Bay. Our motto, *Save the Bay*, defines the organization's mission and commitment to reducing pollution, improving fisheries, and protecting and restoring natural resources such as forests, wetlands, and underwater grasses. CBF represents more than 300,000 members who support the wise management of the region's living resources. CBF staff and its members have been involved in menhaden management efforts both in the Chesapeake Bay and along the Atlantic Coast for more than 20 years.

3.1.1 Allocation Options for Addressing the Minimum Allocation

CBF supports **Option A**. Status Quo which maintains the current 0.5 percent fixed minimum allocation. This minimum level of allocation allows for landing of a small amount of menhaden bycatch and reduces the likelihood of regulatory discards in states without commercial fisheries. It also allows for quota transfers when necessary to support increased resource availability in other states. This state-by-state approach has generally worked well and allows for states to harvest menhaden to support locally important fisheries and ensure available quota through different periods of abundance.

BROCK ENVIRONMENTAL CENTER

3663 MARLIN BAY DRIVE | VIRGINIA BEACH, VA 23455 | 757-622-1964 | CBF.ORG

3.1.2 Timeframes to Base Allocating the Remaining TAC

CBF supports **Option 2** which would use landings from 2018, 2019, and 2021 as the timeframe for allocating the remaining total allowable catch (TAC). Soon after the adoption of Amendment 2, it became apparent that certain sectors of the fishery suffered from a lack of reporting data and therefore landings, particularly in the bait fishery, during the 2009-2011 timeframe. In addition, both the regional abundance of the stock and associated fishery has changed significantly since adoption of the 2009-2011 timeframe. Option 2 more closely matches the geographic abundance and recent changes in the fishery and represents the best available information for menhaden landings.

3.2.1 Increase the Set-Aside

CBF supports **Option 2**, specifically to increase the Episodic Events Set-Aside for New England states to five percent. This would allow flexibility to address periodic high abundances of menhaden in New England waters while minimizing losses due to regulatory or environmental events.

3.3.1 Timing of IC/SSF Provisions

CBF supports **Option 2**. States such as Virginia have developed sector-specific allocations based on historical landings. The reduction fishery in Virginia has the largest quota along the Atlantic coast and to require the bait fishery's entry into the IC/SSF program to wait until the entire reduction quota is landed would be detrimental to smaller-scale fisheries.

However, CBF recognizes the possibility that sector-specific allocations could be implemented in such a way as to allow fisheries to quickly enter the IC/SSF fishery by setting artificially low sector-specific allocations. We urge the Board to include safeguards against this activity by, for example, requiring historical allocations to be considered and/or review of sector-specific allocations through the annual FMP compliance process. Any flexibility that this option would provide must be responsibly balanced with transparency and accountability.

3.3.2 Permitted Gear Types, of IC/SSF Provisions

Incidental catch provisions for menhaden were first implemented in Amendment 2 as a means to support bycatch of menhaden in stationary, multi-species gear. This helped avoid regulatory discards and allowed for landings of limited numbers of fish through the 6,000 pound per day trip limit. Amendment 3 added directed gears, including purse seines, to this provision, the effect of which has been profound. Since Amendment 3, landings under the IC/SSF program have

increased by 200 percent, now representing up to three percent of the total coastwide TAC. In 2020, 53 percent of Maine's landings were a result of the IC/SSF program, landing nearly 14 million pounds. Specifically, purse seine landings increased from 57 percent prior to Amendment 3 to 88 percent of IC/SSF landings after Amendment 3. These trends clearly demonstrate a significant increase in directed landings and justifies further evaluation of the appropriateness of inclusion of directed gears in this program.

These trends are especially concerning as IC/SSF landings have caused the total coastwide TAC to be exceeded in recent years, which is unaccounted for in overage paybacks. Therefore, CBF supports **Option 3** which would ensure that only non-directed gears use this provision. Gears such as purse seines, even on a smaller scale, do not meet the criteria of an incidental catch or small-scale fishery. Removing directed gears from this program would better align with the goals of Addendum I to allocate quota to states where menhaden are available, rather than allowing extraneous landings through this provision with little accountability.

3.3.3 Trip Limit for Directed Small-Scale Fisheries of IC/SSF Provision

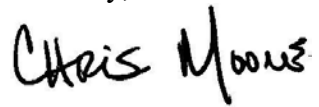
Currently, trips landing the maximum 6,000 pounds per trip limit are dominated by purse seines. Should purse seines be removed from the IC/SSF provisions, CBF believes that a 6,000-pound trip limit is appropriate for small-scale, non-directed gears. If purse seines are retained in the IC/SSF program, CBF supports **Option 3** which would establish a 3,000 pound per day limit for directed gears.

3.3.4 Catch Accounting of IC/SSF Provision

Landings by the IC/SSF have increased dramatically over the past few years resulting in a million pounds of menhaden being landed each year that do not count toward the coastwide TAC. In the Chesapeake Bay region, many of these landings come from stationary, non-specific gears such as pound nets, which are deployed for a variety of species throughout the fishing season. Now, however, the volume of menhaden landings under the IC/SSF provision has resulted in total landings greater than the TAC. This is a critical issue as the coastwide TAC is set based on recently adopted ecological reference points which account for the importance of menhaden to coastal ecosystems. Exceeding the coastwide TAC, regardless of the source of the exceedance, puts the sustainability of predator species at risk. The Board should adopt **Option 2** in order to ensure all landings of menhaden are counted towards the coastwide TAC. Further, CBF, supports **Option 2B, Sub-Option 2** which would allow the Board to revise the gear types included in the IC/SSF program Board action as needed.

Thank you for your consideration of these comments on Draft Addendum 1 to the Atlantic Menhaden FMP. CBF hopes that these comments are helpful in the deliberations by the Board.

Sincerely,

A handwritten signature in black ink that reads "Chris Moore". The signature is written in a cursive, slightly slanted style.

Chris Moore
Senior Regional Ecosystem Scientist

cc: Alison Prost, Vice President, Environmental Protection & Restoration, CBF
Peggy Sanner, Virginia Executive Director, CBF
Josh Kurtz, Maryland Executive Director, CBF



Managing the Needs of our Customers Through our Commitment to Sustainable Fisheries

September 30, 2022

Mr. James Boyle
Senior FMP Coordinator, ASMFC
1050 N. Highland St., Suite 200 A-N, Arlington, VA
By Email to: jboyle@asmfc.org / comments@asmfc.org

Re: Draft Addendum 1 to Amendment 3 of the Atlantic Menhaden IFMP

Dear Mr. Boyle and members of the Atlantic menhaden board:

Lund's Fisheries was established in 1954 and is a family owned and operated, vertically integrated seafood company. Like many multi-generational fishing businesses in our community, I represent the third generation and have been actively working at Lund's Fisheries in sales, production, and management roles since 1994.

Our investments in shoreside processing and freezing capacity over the years have positioned Lund's as a leader in providing high quality Atlantic menhaden for bait in a variety of food fisheries operating on the Atlantic and Gulf of Mexico, including the lobster, crab and crawfish fisheries.

Lund's Fisheries currently employs 150 people annually, between our Cape May and Bridgeton, New Jersey locations, and another 80-90 fishermen in our fleet of fishing vessels. We also work with many independent fishermen who rely upon us to purchase their harvest and, together, develop markets for local seafood products, including Atlantic menhaden, as they become available.

New Jersey has established a limited entry program for its menhaden purse seine fishery and individual transferrable quotas are in use, for both harvesting and landing menhaden, to spread fishing effort out over the season and efficiently maximize both resource and market opportunities for the Cape May menhaden fleet and our plant as we have been forced to work with a limited quota for the past 10 year.

Our comments on the Draft Addendum follow:

Statement of the Problem:

We do not agree that the dynamics in the commercial menhaden fishery have changed since the implementation of A3 in 2017, as stated in the draft addendum. In fact, since the A1 quotas were established in 2012, New Jersey has both stayed within its quotas and, in each year, the fishery was closed while menhaden persisted in the area well into the fall months.



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This is not a new phenomenon affecting only the northern states around the Gulf of Maine. In fact, it appears that Atlantic menhaden are successfully overwintering north of the Chesapeake Bay as the stock appears to be benefitting from a warming ocean. These stable fishery dynamics isolates the fact that those northern states are either unwilling or unable to stay within their allocated quotas, which should not result in a threat of another reduced quota in states that depend upon the Atlantic menhaden fishery for jobs and community stability during the summer and fall months, as is the case in the State of New Jersey.

While northern states have been allowed to exceed their quota, since at least 2017, through the intended use of the Episodic Event Set-Aside (EESA) program combined with their irresponsible use of the Incidental Catch and Small-Scale Fisheries (IC/SSF) provision, other states south of NY, which have not had access to the EESA but have stayed within their Amendment 1 and 3 quotas while prohibiting directed gears, including purse seines, to be used in the incidental catch fishery. The result has been to allow an increase in recent landings in the northern states without the same opportunity being made available to other states, which are closing their fisheries to stay within their quota even though fish remain available to those states' fisheries following the closure of the directed fishery. This situation continues to threaten the stability of New Jersey's menhaden fishery. Making management changes through this addendum is important coastwide.

Commercial Allocations:

While we support the intention of the Addendum to “enable states to maintain current directed fisheries with minimal interruptions during the season”, we do not agree that the availability of the resource has changed to the extent that a reallocation of existing A3 quotas, from states with a historic menhaden fishery, can in any way be justified.

3.1.1 – Allocation Options for Addressing the Minimum Allocation

We support Option B – the Three-tiered fixed minimum approach, which would assign states to three tiers (0.01%, 0.25%, or 0.5%), with the result being that the states without a fishery would be awarded a lower fixed minimum allocation. PA, SC and GA would be included in Tier 1 @ 0.01% and CT, DE, NC and FL would be included in Tier 2 @ 0.25%. The remaining states would be in Tier 3 @ the status quo minimum of 0.5% of the coastwide quota.

3.1.2 – Timeframes to Base Allocating the Remaining TAC

We support Option 3 – Weighted time frames, considering both recent and historical timeframes with sub-options of different weighting values and support Option 3A, Sub-option 2 weighing the allocation timeframes of 2009-2011 and 2018, 2019 & 2021 evenly.



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4 – Moving average – this option would use a three-year moving average to annually adjust allocations as the stock and fishery dynamics change (i.e., 2018, 2019 & 2021 average would be used to set 2023 allocation).

We strongly support Option 4A, and are opposed to the recent years, moving average option, since using the current-years' moving average clearly disadvantages those states, like New Jersey, without access to the EESA and responsibly using its IC/ISSF opportunities as intended by the Commission. Retaining the fishing history from 2009-2011 is important to New Jersey, a state with a historic fishery that is limited today to harvesting only its A3 quota, and with no other opportunity to increase its annual catches. This has been the case here since the implementation of A1, in 2012, when our states' access to the Atlantic menhaden resource was reduced by nearly 50%.

EESA Program

3.2.1 – Increase the Set-Aside

We support the Status Quo EESA allocation of 1% of the total coastwide TAC, with any EESA quota remaining unused after 10/31, annually, to be reverted back to the common pool. We do not support increasing the EESA allocation up to 5%, either as a static amount or set annually during the specifications process.

3.3 – IC/SSF Provision

3.3.1 Timing of the IC/SSF Provision

We support Option 1 (Status Quo); once a quota allocation is reached for a given state, that fishery moves to an incidental catch fishery, to finally require all states to consider the use of this provision in the same way.

3.3.2 Permitted Gear Types of the IC/SSF Provision

We strongly support Option 2, which would remove the use of purse seines from the definition of small-scale and non-directed gears. This has been the position of the State of New Jersey since implementation of A1 in 2012. The use of purse seines as a non-directed gear in northern states has been unfair and wrong for years and has allowed for the irresponsible use of the IC/SSF provision throughout that time, to the detriment of states otherwise appropriately using the provision as originally intended. The 150 fathom (900 foot) seine used by Maine as a 'small scale' gear is the same size seine limit established for New Jersey's directed purse seine fishery, which has been excluded from the IC/SSF since the establishment of quotas in the fishery, in 2012, through the implementation of Amendment 1.



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3.3.3 – Trip Limit for Directed Small-Scale Fisheries of IC/SSC Provision

We support Option 1, no change to the current small scale and non-directed gear types of up to 6000 pounds of menhaden per trip per day. Two authorized individuals, working from the same vessel fishing stationary multi-species gear would continue to be permitted to work together and land up to 12,000 pounds from a single vessel, limited to one vessel trip per day. This provision has been responsibly utilized and monitored by the State of New Jersey since its implementation through A1 and has benefitted our gill net fishermen who historically have landed menhaden for bait for recreational fishermen targeting striped bass, following the closure of the directed fishery, for several years. Maintaining this trip limit will work to reduce regulatory discards in the fishery.

3.3.4 – Catch Accounting of IC/SSF Provision

We support Option 2, requiring IC/SSF landings to be evaluated against the annual, coastwide TAC. If IC/SSF landings cause the TAC to be exceeded the Board would take action either by modifying the trip limit for permitted gear types or by eliminating one or more gear types from the IC/SSF provision. This change would protect those states accurately reporting their catches and staying within their quotas, like NJ, over the last 10 years.

Thank you for your attention to and your consideration of our comments and concerns.

With best regards,

Wayne Reichle

Wayne Reichle, President
wreichle@lundsfish.com

James Boyle
FMP Coordinator
1050 N. Highland Street
Suite 200 A-N
Arlington, Virginia 22201



Re: Comments on Atlantic Menhaden Draft Addendum I

September 30, 2022

Dear Mr. Boyle,

The Maine Coast Fishermen's Association (MCFA) would like to take this opportunity to comment on the Atlantic Menhaden Draft Addendum I. MCFA is an industry-based nonprofit that identifies and fosters **ways to restore the fisheries of the Gulf of Maine and sustain Maine's historic** fishing communities for future generations. Established and run by Maine fishermen, the objectives of the MCFA are to provide a voice for our fishing communities, to rebuild the Gulf of Maine ecosystem, and to support diverse fishing businesses throughout Maine.

Addendum I was created with the intent to align state quotas with recent landings and assessment data **while also maintaining access to the fishery for the states managed under the ASMFC's Interstate Fishery Management Plan.** MCFA represents community-based fishermen from Maine and advocates for their concerns which include access to the Menhaden fishery and the maintenance of a substantial forage base within the ecosystem. It is clear that, through the conservation-focused efforts of the ASMFC, the menhaden fishery has expanded its range into the Gulf of Maine significantly and that, with continued appropriate management, the fishery will continue to inhabit that expanded range.

As such, increased access for fishermen and communities in the Northeast is crucial. MCFA has provided the following comments and recommendations for options as outlined in Addendum I.

MCFA supports the following:

- Minimum allocation & time frame used:
 - MCFA supports 3.1.1 Option A which maintains the 0.5% minimum quota for each state. The alternative three-tiered option puts states which currently have low landings at a disadvantage and does not allow for those states to increase their landings in response to changes in the resource in the future.
 - MCFA supports 3.1.2 Option 4 Sub-option 4A which uses a three-year moving average to annually adjust allocations as the stock and fishery dynamics change and uses total landings in the calculations. The use of a moving average allows for more responsive management decisions as the resource changes over time and the use of total landings makes the best use of the available data in making those decisions.
- Episodic Event Set-Aside (EESA):
 - MCFA supports 3.2.1 Option 2, Sub-option 1 which would increase the percentage allocated directly to the Episodic Event Set-Aside to the maximum amount of 5% and set this as a static amount. The number of quota transfers has increased over time showing a very real need for this program. Increasing the percentage to a fixed amount of 5% allows

for flexibility for states and managers to respond to changes in the fishery faster than regional management actions would be able to moving forward.

- Incidental Catch and Small Scale Fisheries Provision (IC/SSF):
 - MCFA supports 3.3.1 Option 1 **which maintains that a state's fishery moves to an incidental catch fishery** once the quota allocation is reached for that state. This maintains the maximum flexibility for each participating state to decide whether this refers to the entire allocation or a sector, fishery, or gear allocation.
 - MCFA supports 3.3.2 Option 1 in regards to permitted gear types which maintains all currently permitted gear types. This includes both small-scale directed gear and non-directed types. In particular, we would like to stress the importance of maintaining access for purse seine gear types in the fishery as these are an important gear type in Maine. Purse Seines are considered a very clean way to fish for menhaden, and most importantly are NOT a fixed gear fishery which could potentially put additional lines in the water at a time when reduction of gear, particularly endlines, is of the utmost importance.
 - MCFA supports 3.3.3 Option 1 which maintains the trip limit for the IC/SSF provision at 6,000 pounds per trip per day for all small-scale gear and non-directed gear types. Reducing the trip limit for small-scale directed gear, as proposed in the other options, does not maintain adequate access to the resource for small-scale fishermen.
 - MCFA supports 3.3.4 Option 2 which would include catch from small-scale fisheries as a part of the menhaden TAC and would ensure that all landings data from this fishery are considered when assessing the status of the resource. This is essential to manage the fishery appropriately.

Thank you for your time and attention to this important issue. We would be happy to provide any further details about any of the specific options we requested.

Sincerely,



Ben Martens

Executive Director



MAINE

Lobstermen's Association, Inc.

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207-967-4555 * 866-407-3770 * www.maine lobstermen.org

Atlantic States Marine Fisheries Commission
James Boyle, Senior Fishery Management Coordinator
1050 North Highland St, Suite 200 A-N
Arlington, VA 22201

Via email

September 30, 2022

Dear Mr. Boyle:

The Maine Lobstermen's Association (MLA) provides these written comments in response to ASMFC's *Draft Addendum 1 to Amendment 3 of the Atlantic Menhaden Interstate Fishery for Public Comment*. The MLA was founded in 1954 and is the oldest and largest fishing industry association on the east coast. The MLA advocates for a sustainable lobster resource and the fishermen and communities that depend on it. The MLA strongly supports management options which better match quota to areas where the menhaden resource is available, and which continue to support a flexible and robust small-scale fishery.

Atlantic Menhaden has become the most important bait fish for Maine's lobster fishery, which directly supports well over ten thousand jobs and generates at least \$1.5 billion in economic activity in Maine. Maine's lobster industry is a primary economic driver that serves as the foundation of Maine's coastal economy because, by law, all Maine lobstermen must own and operate their own vessels. Access to a steady supply of local baits – fresh or frozen – has been challenging in recent years. Due to the severe reduction of Atlantic herring quota, the lobster industry is no longer able to source the majority of its bait locally and prices have skyrocketed. Sustainably managing local bait stocks such as Atlantic menhaden and allowing the fleet to access those fish when and where they are present is fundamental to the continued success of the Maine lobster fishery.

The recent increases in Maine's menhaden landings have provided some stability of supply and price to Maine's lobster bait market. When menhaden are landed locally, Maine lobstermen have access to a steady supply of fresh bait that is more affordable than other baits that are trucked in and stored. Lobstermen report that the bait they purchase from Maine boats is comprised of fish significantly larger than those shipped in from other states. They contend that Maine pogies are half the cost and work twice as well. If the fish are abundant in Maine, it makes sense to catch them where they are used.

In recent years, fishermen have been unable to catch menhaden that are readily available in Maine waters due to insufficient quota allocation. Maine's menhaden fleet has been underutilized relative to resource availability and forced to fish inefficiently to conserve quota allocation. The fleet is consistently shut out while fish are still readily available. This mismatch of quota to resource availability causes unnecessary variability in the menhaden bait supply, leading to price and supply instability.

Many lobstermen are also highly dependent on catch from the small-scale menhaden fishery. This is an extremely clean fishery prosecuted with purse seines that release non-target fish alive. Catch from the

small-scale fishery allows lobstermen to supply their own bait and avoid paying significantly more for lower quality baits from other areas. They are also able to provide a local, affordable bait option for others in their community.

Accordingly, the MLA supports the following options in Draft Addendum I.

Issue 3.1 Commercial Allocation

The MLA supports establishing a three-tiered fixed minimum allocation to account for 5.53% of the total TAC. The MLA then supports using a three-year moving average, based on total reported landings, to annually adjust allocations as the stock and fishery dynamics change. The MLA does not support overage paybacks unless the Total TAC for the Atlantic menhaden fishery is exceeded.

Issue 3.2 EESA Program

The MLA supports increasing the EESA to up to 5% of the Total TAC and allowing the Menhaden Board to set this annually or on a multi-year basis to keep the program flexible in addressing changes to the resource and fishery.

Issue 3.3 IC/SSF Program

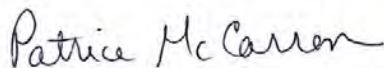
The MLA supports maintaining the status quo for the small-scale menhaden fishery to maintain existing daily limits with no change to currently permitted gear types.

The MLA strongly opposes any option that would exclude the use of purse seines. This is the primary gear used by fishermen in Maine's small-scale menhaden fishery. It is a very efficient and clean gear that allows fishermen to target menhaden and release live non-target species. Taking away the small-scale fishery would eliminate access to affordable bait and compromise the profitability of many lobster businesses. The ability to catch your own bait and also sell to local fishermen keeps operational costs down and increases chances of making a paycheck when the boat price for lobster is low and bait prices are high. In Maine, supporting small boats is essential to the survival of the lobster industry and our coastal communities.

In closing, the MLA urges ASMFC to support options to better align commercial allocation with resource availability. This includes maximizing Maine's baseline quota so that it aligns with the availability of the menhaden resource along the Maine coast. Increasing the Maine quota to better match resource availability would support the menhaden resource by targeting larger fish and provide lobstermen access to high quality, locally caught bait at lower prices.

Thank you for your consideration.

Sincerely,



Patrice McCarron
Executive Director



September 30, 2022

Via Electronic Mail

James Boyle
Senior Fishery Management Plan Coordinator
Atlantic States Marine Fisheries Commission
1050 North Highland St., Suite 200 A-N
Arlington, VA 22201

RE: Comments on Addendum I to Amendment 3 to the Interstate Fishery Management Plan for Atlantic Menhaden

Dear Mr. Boyle:

This letter is submitted on behalf of Ocean Harvesters and Omega Protein Corporation who appreciate this opportunity to comment on Addendum I to Amendment 3 to the Interstate Fishery Management Plan for Atlantic Menhaden. This action was initiated by the Atlantic Menhaden Board to revisit the menhaden total allowable catch (“TAC”) allocation among the Atlantic States Marine Fisheries Commission (“ASMFC” or “Commission”) member states and jurisdictions. There are no states or entities with as much at stake in this process as Virginia and, by extension, these two companies Reedville, Virginia-based companies.

For background, Ocean Harvesters, a U.S. company formed in 2018, owns eight purse seine vessels operating out of Reedville, Virginia that harvest Atlantic menhaden. Ocean Harvesters sells its catch to Omega Protein under a long-term Supply-Support Agreement. Omega Protein was founded in 1913, though one of its predecessor companies, the John A. Haynie Company, was first established in 1878. Omega Protein is deeply rooted in this rural fishing community where it has been producing needful products, such as those for aquaculture, agriculture, and human nutrition, from menhaden for over 140 years.

The importance of these companies to their community cannot be overstated. Collectively they are the largest private employers in Northumberland County, a community that is deeply impacted by the decisions currently before the Board. Allocation reductions directly lead to job losses. As the Commission’s 2017 socioeconomic study of the menhaden fishery shows, a five percent change in TAC allocation to the reduction sector (using 2017 as a baseline) leads to a gain or loss of \$3.6 million in economic activity and 77 jobs in Northumberland County alone. *See* Addendum I at 11. While the companies recognize that Virginia is likely to lose quota share in this process, the companies hope that the Menhaden Board will keep mind the importance of this historic fishery and long-time fishery participants and keep such losses to a minimum.

There are available choices that help the New England states continue to take advantage of the recent local availability of menhaden while also protecting the historic reduction fishery and the traditional bait fisheries of Virginia and New Jersey which compete with the New England fishery. Specifically, the best set of allocation options to meet these goals includes adopting the three-tier minimum allocation alternative (3.1.1, Option B); the weighted allocation timeframe based on equal weight on average harvests between 2009 and 2011 and those from 2018, 2019, and 2021 (3.1.2, Option 3A, Sub-option 2); and status quo on the Episodic Event Set-Aside (1%) (3.2.1; Option 1). Our rationale follows.

Justification for Preferred Allocation Options

For the second time in two reallocations, Virginia is posed to lose share of its historic quota share to other states.

In 2012, Amendment 2 created a coast-wide menhaden TAC and allocated it among states based on average catches from 2009-2011. Virginia's initial allocation under this amendment was 85.32%. This was reduced by 6.7% in 2017 to provide all states, including those with no fishery like Pennsylvania, a "minimum allocation" of 0.5% and to increase the New England states' (including New York) allocation by 150% (from 2% to 5%). The latter reallocation was justified by a shift in menhaden availability in the north, particularly to inshore Gulf of Maine. The minimum allocation, however, simply created inefficiencies. It deprived traditional fisheries in Virginia and New Jersey of historic share while also making it impossible for states like Maine to rationally manage their growing fishery because the northern states had to plead for transfers once their TAC was exhausted.

Under Addendum I, the best outcome Virginia can reasonably hope for is to lose only another 0.5% percent of its allocation. At its most extreme, Virginia could see its allocated share of the quota cut to under 72%, or a 16% reduction from its Amendment 2 baseline. Based on the Commission's socioeconomic analysis, this implies a loss to Virginia of over 300 jobs and \$17 million in economic output in its bait and reduction sectors since the TAC was first established.¹

Some of these losses are gains to other states,² but those adversely impacted Virginians are life-long, and often second or third generation, participants wholly dependent on the menhaden fishery. **Both companies are asking the Menhaden Board to provide a level of stability to Virginia's historic reduction and bait fisheries as it also allows for reasonable increases in opportunities for newer entrants.** To that end, Omega Protein and Ocean Harvesters respectfully recommend the Board adopt the following options:

¹ John C. Whitehead & Jane Harrison, *Socioeconomic Analysis of the Atlantic Menhaden, Commercial Bait and Reduction Fishery A Report to the Atlantic States Marine Fisheries Commission*, at 37-43 (Tables 35 & 38) (May 3, 2017), available at http://www.asmfc.org/uploads/file/5952c923ASMFC_MenhadenSocioeconomicReport_June2017.pdf.

² Although notably, any such gains would likely be less than the jobs and economic impact lost. See Addendum I at 11 ("Interestingly, subsequent analysis of coastal county income and employment changes in response to changes in bait landings (not reduction landings) showed little effect, casting some doubt on the conclusion that adjustments in menhaden TAC consistently lead to changes in fishery income and employment in the bait fishery.").

Step 1, Minimum Allocation (3.1.1): Option B, the Three-Tier Allocation.

Providing every state with a minimum amount of TAC creates distortions and inefficiencies by reducing allocations to traditional menhaden fishing states (Virginia and New Jersey) while under-allocating TAC to states with growing fisheries. Ideally, the minimum allocation, implemented by Amendment 3, would be removed and TAC allocations would be based on historic dependence and current use. This is not an option, and thus the best alternative is Option B which more closely aligns the minimum allocation with current use and gives more to states with active fisheries. This is a better approach than the status quo for the following reasons:

- As the Addendum I Public Hearing Document explains in its Statement of the Problem section, “[t]he current allocations have resulted in ... TAC not being fully used coastwide while some states do not have enough quota to maintain current harvests.”
- A better alignment of allocation with use is more efficient, reducing the need for, and amount of, in-season transfers of quota between states.
- The three-tier system likewise better enables states to better manage their fisheries by reducing the number of times they must open and close their fisheries while awaiting transfer of TAC from states that do not have fisheries.
- This alternative benefits the majority of states, while still providing states with smaller fisheries and whose allocation will decrease enough TAC to maintain recent catch levels.
- It will also better help the fishery achieve the TAC—which has recently been reduced to account for menhaden’s role as forage in the ecosystem—by reducing the amount of quota “stranded” in states without an interest in either harvesting or transferring their allocations.

Step 2. Timeframes to base allocating the remaining TAC (3.1.2): Option 3A, Sub-option 2, Base Allocations on 50% Recent and 50% Historic Catch.

This option is the only one that fairly weights historic dependence on the fishery by the traditional Mid-Atlantic menhaden fishing states while still providing a substantial increase in TAC to the New England states. Notably, the states most dependent on the fishery, Virginia and New Jersey, will see their share of the TAC reduced under this option, but the loss is reasonable compared to other options. This helps provide their established industries some stability. Meanwhile, this option adds nearly 3% to the New England states’ allocation and maintains their ability to receive transfers from states that will continue to have more TAC than they have used in recent years. The northern states also have access to the episodic event set aside.

The reasons this allocation is the most fair and equitable to all states include:

- The Virginia reduction and bait fishery (the second largest after New Jersey’s bait fishery) have centuries’ worth of reliance on the menhaden fishery. **Virginian’s infrastructure investments and the companies and jobs that depend on the fishery deserve at least equal consideration with new entrants.** For example, Ocean Harvesters and Omega Protein have together invested over \$60 million in long term capital improvements since

Amendment 2 was implemented—upgrading vessels, production, and packaging equipment and improving customer support and operational efficiency.

- Any option that weighs recent history more heavily, such as 25/75 option, gives undue influence to the dramatic increase in the New England bait fishery between 2017 and 2021 based on an episodic interval of abundance and the fact that New England states were able to be relatively unconstrained by their respective TACs.³ Over that period, landings in Maine to New York **increased four-fold** (10.9 million lbs. to 43.7 million lbs.) while the **traditional Mid-Atlantic fisheries were limited by their TACs**, which for the largest fisheries in New Jersey and Virginia were lower than historic shares.
- Fisheries management means living within constraints. **It is neither fair nor equitable to grant some states the full measure of recent increased opportunities at the expense of historic participants that have operated under the rules set by the Board.**
- It should be noted that even if the episodic event set-aside remains at 1% (which the companies suggest it should), any of the alternatives that use **only** recent history **will give New England states substantially more TAC than they have harvested in any year since the TAC was established.** For instance, assuming the three-tier minimum allocation and a 1% EESA, Option 4A allocates 46.9 million pounds of 2023 TAC to New England states, compared to 43.7 million pounds landed in the region in its best year thus far, 2021.
- The Mid-Atlantic bait sector sells to the same markets as do the New England bait fisheries. It is inequitable to severely discount historic bait participants' long-term investments in the fishery. There is no principled basis for reallocating fishing opportunities from long-time bait harvesters simply so their new competitors do not have to face any reductions or constraints.

As a final note the companies would like to address some comments that were made during the public hearing process regarding the supposed inequity of Virginia's current allocation, which at 78.66% is still 6% lower than its Amendment 2 share. Some members of the public and organizations have also suggested that there may be ecological concerns associated with the amount of TAC harvested in the Mid-Atlantic region. These comments miss the mark.

First, menhaden harvests in the mid-Atlantic region generally, and within the Chesapeake Bay specifically, have been at historic lows in recent years.

One big factor in these declines was the closure of Beaufort Fisheries in North Carolina in 2006, which was the last remaining menhaden reduction facility (out of the scores which used to dot the east coast) other than Omega Protein. During the 1990s, the coastwide reduction catch averaged nearly 300,000 metric tons ("mt") per year. From an even longer historical perspective, decreases in the reduction fishery have been even more dramatic. In the 1950s, its harvests averaged 625,000 mt of menhaden per year. Between 1960 and 1989, average annual menhaden harvest for reduction purposes was 330,000 mt. Today's catches are 60% lower than that.

As to the subset of the fishery in the Chesapeake Bay, removals from 2003-2005 were 109,020 mt, equal to the original Bay reduction fishery cap. Today, that cap has been reduced by

³ New Hampshire had no traditional menhaden fishery but accounted for nearly 2% of coastal landings in 2021.

more than fifty percent and recent overall reduction fishery harvests are 117% lower than 1990s levels. Since Amendment 2, the companies' Chesapeake Bay harvests average 41,000 mt per year, whereas the reduction fishery took on average 147,700 mt per year from the Bay between 1980 and 1999.

The point is that this fishery is smaller and has less impact on the Chesapeake Bay and the coastal ecosystem today than at any sustained period over the past 67 years.

Second, there is no evidence that the Mid-Atlantic reduction fishery has had any adverse impact on the marine ecosystem, even when its harvest was magnitudes greater than current levels. At virtually every meeting of the ASMFC Menhaden Board, a member of the public will testify that at some point in the past they could “walk across menhaden in the Bay” or opine how great striped bass and other sport fishing was. What never gets noted is that in that halcyon past, much more menhaden were being harvested both in the Bay and along the Mid-Atlantic coast. In fact, Chesapeake Bay menhaden harvests were **three times higher** during the period striped bass rebuilt than over their recent period of decline. Blaming the menhaden fishery for striped bass' woes or other environmental problems is easier than dealing with overfishing, poor water quality, aging municipal wastewater systems, the loss of wetlands nursery habitats, the continued armoring of the existing shorelines, and climate change.

In fact, many environmental groups have supported options that would lead to the most extreme reallocation of TAC to the northern states. But not one has mentioned or grappled with the Menhaden Technical Committee's finding, based on Dr. Alexei Sharov's research, that a shift of the fishery to the older menhaden found in northern waters has a greater negative impact on the population's fecundity than does a Mid-Atlantic fishery focused on age-1 to age-3 menhaden. This is not to say that the New England fishery is problematic. Indeed, the very precautionary TAC guarantees the fishery as a whole is sustainable both from a population and ecosystem perspective. It is to say, however, that organizations and individuals that purport to be guided by science are quick to make unsupported claims and slow to examine actual scientific evidence and empirical data provided by the Commission's and National Marine Fisheries Service's scientists.⁴

In sum, it is not unfair, inequitable, nor biologically problematic that Virginia receives the lion's share of the TAC. It is based on actual use of a resource upon which there were no management restrictions on catch up until 2012. Communities like Reedville, Virginia have been dependent on the menhaden fishery for over a century. At the same time, Virginia has given up substantial quota that has allowed other states to develop their fishery and will do so once again in

⁴ Another example is the oft made claim that menhaden “clean” water or prevent algal blooms, a point raised again in this process. In fact, direct studies show no impact on nitrogen levels. See Lynch, P.D., M.J. Brush, E.D. Condon, and R.J. Latour. 2010. Net removal of nitrogen through ingestion of phytoplankton by Atlantic menhaden (*Brevoortia tyrannus*) in Chesapeake Bay. Marine Ecological Progress Series 401: 195-209. Menhaden older than age-0 feed by filtering water, but gillrakers in older fish are too large to capture small particulate matter; rather, they feed on larger phytoplankton and zooplankton, which themselves are the primary consumers of small phytoplankton. Brush, Mark J., *et al.* *Modeling Atlantic Menhaden In Support of Nutrient and Multispecies Management*, Final Report for Environmental Protection Agency Grant No. CD-973256-01-0, submitted to the Chesapeake Bay Program (2010). Finally, menhaden “have the potential to rapidly remineralize nutrients and excrete them back to the water where they could stimulate phytoplankton growth and nitrification, and negatively affect water quality.” (Brush, *et al.*, 2010).

this process. However, the Virginia reduction and bait fishery deserve some stability, which Option 3A, Sub-option 2, which weights historic and recent catch history equally, will provide.

Section 3. The Episodic Event Set-Aside (“EESA”) (3.2.1): Option 1 Status Quo 1%.

As an initial matter, because the set-aside comes off the top of the quota, it disproportionately impacts the states with the largest fisheries. Every 1% increase in the EESA costs Virginia 0.78% and New Jersey 0.11% of their share of the TAC. Thus, increasing the set-aside to 5% would take 3.9% of Virginia’s TAC and cost New Jersey over half a percent of its allocation. For many of the reasons specified above, the companies believe this to be inequitable not only to Virginia, but also to other Mid-Atlantic states that would be required to sacrifice TAC to allow their new competitors in the northern bait fishery to increase market share.

Moreover, an increase in the EESA is not necessary to make the New England states whole (or nearly so) compared to recent catch history. Addendum I makes direct adjustments to calibrate northern landings to recent landings history. Also, the fact that the minimum allocation will be retained means a substantial amount of unused TAC will remain available for transfer to northern states. That provides more than a reasonable accommodation for the episodic increase in menhaden abundance in the north. It should not be the goal of menhaden management to ensure that some states can catch as much as they can while other states are constrained. The Commission should not be picking economic winners and losers. The status quo is the most equitable option for the majority of states.

Other Issues/Options in Addendum I: The companies take no opinion on any of the other options and issues included in the addendum.

####

Omega Protein and Ocean Harvesters appreciate this opportunity to comment on Addendum I. Most commenters have advocated for a suite of options that best benefits their state and their own economic interests. This is understandable and this letter largely does the same. It is worth noting, however, that what the companies advocate for here still results in a loss of TAC for Virginia. They believe, however, this approach is most consistent with general fishery management principles, primarily making allocation decisions that balance historic dependence and current use of a resource. Allocation decisions should try to avoid resulting in job losses in historic fishing communities when possible. It is avoidable in this Addendum.

The companies hope that you give serious consideration to these comments. I and their representatives will be happy to answer any questions you may have.

Sincerely,

/s/ Shaun M. Gehan
Shaun M. Gehan

Counsel for Omega Protein Corp. & Ocean Harvesters



Reedville Bait, Inc.

P.O. Box 370

Burgess, VA 22432

September 30, 2022

VIA ELECTRONIC MAIL: BOYLE@ASMFC.ORG

James Boyle, IV, FMP Coordinator
Atlantic States Marine Fisheries Commission
1050 N. Highland Street, Suite 200 A-N
Arlington, Virginia 22201

RE: Atlantic Menhaden Draft Addendum I

Dear Mr. Boyle:

Reedville Bait is one of the largest of all the state menhaden bait fisheries. Based in Virginia's Northern Neck, our company has experienced increased demand for our products. Menhaden processed at our operations in Virginia are used by watermen along the East Coast and Gulf States. More specifically, our products are used to support crabbers in Georgia, South Carolina, North Carolina, Delaware, and Maryland, and our chum product is used by recreational fishermen in Florida, and throughout the Chesapeake Bay states. We have seen in just the past few years an increased demand for our products in each of these states.

Unfortunately, the commercial growth of our bait companies has been limited by recent decisions by the ASMFC Menhaden Management Committee.

The current TAC for menhaden – set by ASMFC – is 194,400 MT. Virginia receives 78.66% of the TAC. The bait sector receives just 9.96% of this allocation – or about 33 million pounds. The remainder and bulk are allocated to the reduction sector.

This background for the menhaden fishery in Virginia is important as ASMFC considers its addendum to Amendment 3 of the Atlantic Menhaden Interstate Fishery Management Plan. Our goal, as demand for our menhaden products continue to exceed available bait allocations in Virginia, is to minimize impact to our business and the many watermen and customers requesting our products.

We respectfully request that you consider this information when ASMFC considers public comment:

We support the following option:

- **Step 2, Option 3B, providing for weighted timeframe option – Sub Option 2 (50% recent / 50% earlier). This would provide Virginia with only a very small reduction – to 78.13% (v. 78.66% current), and would weight timeframes evenly, or more fairly, in our opinion.**

This option, unfortunately, fails to accommodate the importance of the existing set-asides. As you consider additional action on the existing set-aside program, we wanted to share our perspective. Earlier this year the VA Marine Resources Commission amended its regulation (**CHAPTER 4 VAC 20-1270-10**) to allow the Commissioner to request menhaden transfers from other ASMFC states, with certain provisions. Virginia received more than 3.56 MM pounds, all of which went to the bait fishery. Transfers from the southern ASMFC states, South Carolina for instance which transferred 370,000 pounds, benefitted from this transfer as the volume of fish transferred was returned to that state for use in its crab fishery. Florida's fish transfer was returned to that state in the form of chum to support the recreational fishery there. So, not only are transfers sent to Virginia providing an economic benefit in our Commonwealth, but states that transfer fish are gaining economic benefits when fish are returned to the transferring state for commercial or recreational use. To our knowledge, the Virginia bait fishery – and specifically Reedville Bait – is unique in the dual benefits provided to transferring states.

Reedville Bait Please do not hesitate to contact any of us regarding the contents of this correspondence.

Respectfully yours,

Frederick Rogers
Reedville Bait

S. Lake Cowart, Jr.
Mid-Atlantic Bait

Ronnie Bevans
Reedville Bait

Cc: J. Greene, Commissioner, VMRC
The Honorable T. Voyles, Acting Virginia Secretary of Natural and Historic Resources
Mr. Robert E. Beal, Executive Director
The Honorable Monty Mason, Virginia Senate
Bryan Plumlee



Regal Marine Products, Inc.
198 West 9th Street
Huntington Station, N.Y. 11746
www.regalbait.com
631-385-8284 Fax: 631-271-5294



September 30, 2022

James Boyle, FMP Coordinator
Atlantic States Marine Fisheries Commission
1050 North Highland Street, Suite 200A-N
Arlington, VA 22201

I am writing to you today on behalf of Regal Marine Products, Inc., regarding Draft Addendum I to Amendment 3 of the Atlantic Menhaden Fishery Management Plan. Regal Marine Products Inc., is a wholesale fishing bait and tackle distributor and we service the NJ, NY, CT and RI region. Menhaden is an important bait to the recreational fishing industry. In NY especially, the bait and tackle shops, as well as wholesalers rely on a viable commercial menhaden fishery in our state to support the bait needs of the recreational industry.

As stated within the addendum, the current allocation has resulted in a TAC that is not being fully utilized coastwide, yet some states do not have enough quota to maintain their fishery. NY is one of the states that has found itself shy of enough quota in recent years and has depended upon transfers and the incidental catch provision. In fact, NY is unique in the fact that we do not allow any purse seine fishery, our entire menhaden fishery is small scale.

- With regards to section 3.1.1, I would support Option A for status quo allowing the .5% fixed min. quota.
- With regards to section 3.1.2, I would support Option 2 to change the timeframe to a more recent time frame of 2018, 2019 & 2021. If the board were to go with a weighted time frame, I would support sub-option 1 giving more weight to the recent time series.
- With regards to section 3.3.1 I would support Option 2 that if a state has divided their allocation into sectors, that once that sector reaches their quota it would move into the IC/SSF provision.
- With regards to Section 3.3.2, I am **very opposed** to Option 3 for non-directed gears only. In NY our entire fishery is a small scale and many rely on beach seines. This gear type is extremely low impact, with many harvesters hauling into their pick-up truck under the 6,000lb limit. Under this option, almost our entire fishery would be shut out. A state, such as ours, which has opted not to allow any purse seine fishery, already falls under Option 2. However, without knowing the impacts that a change in quota allocation could give some of the northern states, and their stakeholders who do utilize a purse seine fishery, **I support option 1 for status quo.**
- With regards to section 3.3.3 I would support status quo.

The reality is that 14 states are sharing just 12% of the quota! And at times they are relying on the EESA program and the IC/SSF provision for their fishery to operate as they see increased availability of Atlantic Menhaden. The changes in the herring fishery have also had a tremendous impact to all of the harvesters for bait in the menhaden fishery. Many of the issues concerning the growing dependence on the IC/SSF Provision, stem from the issue that there has been a shift in the availability of fish to different regions and that it is time to re-evaluate the time series and state allocation of the quota. Address the allocation so that the states who have had to overuse the IC/SSF can have a viable fishery and then address the gear types, trip limits, and catch accounting. However, until we know the impact of a quota reallocation and the effect it may have in addressing the states who have overused the IC/SSF provision, I believe it is premature to shut out sectors or gear types for the commercial participants that are among the 14 states sharing just 12% of the overall TAC.

Sincerely,

Melissa Dearborn
Owner/VP – Regal Marine Products, Inc.



39 Industrial Park Road, Unit C
Plymouth, MA 02360
www.stellwagenbank.org

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September 28, 2022

Mr. James Boyle
Senior Fishery Management Plan Coordinator
Atlantic States Marine Fisheries Commission
1050 North Highland St., Suite 200 A-N
Arlington, VA 22201

RE: Atlantic Menhaden Draft Addendum I

Dear Mr. Boyle:

On behalf of the Stellwagen Bank Charter Boat Association (SBCBA) whose membership includes the for hire fleet, recreational anglers, and commercial fisherman that fish in Boston Harbor and Massachusetts state and federal waters, we recommend the following Options concerning Atlantic Menhaden Draft Addendum I.

- 3.1.2 Option 2 - This quota allocation timeframe is based on the most recent average landings from 2018, 2019, and 2021. This timeframe is representative of the increased number of menhaden observed over this timeframe on average each year.
- 3.3.2 Option 2 - Landings from purse seine gears would count against a state's directed fishery quota. The purse seine vessels are operating in a fishery that is supposed to be and incidental small scall fishery that with elevated trip limits is not the case. As a result, we also support 3.3.3 Option 3, with a reduced 3,000 pound trip limit for directed gear types.
- 3.3.4 Option 2 - IC/SSF landings are evaluated against the annual TAC. This provided flexibility and accountability to manage the TAC annually.

In addition to the recommended measures set forth above the SBCBA continues to recommend prohibiting Friday commercial menhaden seining inside Boston Harbor Prior to opening Fridays to commercial menhaden fishing (Monday, Tuesday, Wednesday, and Thursday) in 2021, typically one commercial fishing vessel would fish in Boston Harbor. When the Friday prohibition was lifted in 2021 up to five commercial vessels would fish these waters removing menhaden five straight days a week.



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This led to select conflicts with the recreational and for hire fleet that resulted in one purse seine vessel being banned from commercially fishing for menhaden in Boston Harbor. This has also resulted in additional catch and/or removal of menhaden that is a key forage fish for striped bass and bluefish that the recreational and for hire fleet rely upon.

When the menhaden are caught by the purse seine fleet the striped bass and bluefish disperse until conditions stabilize after a few days that not only impacts Fridays but the weekend. Fridays and the weekends are key to the recreational and for hire fleet and all of those that rely on the blue economy to make a living. As a result, the SBCBA request that MassDMF restrict and not allow Friday purse seine commercial fishing in Boston Harbor as well as the Options associated with Atlantic Menhaden Draft Addendum I.

If you have any questions or comments, please email, or give us a call.

Very truly yours,

Capt Mike Delzingo

Capt. Mike Delzingo
SBCBA, Board of Directors
ff_boston@yahoo.com

Capt Rob Savino

Capt. Rob Savino
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Capt. Jaron Friedman
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Cc: Ron Amidon, MassF&G
Dan McKiernan, MassDMF
Raymond Kane, MassMFAC
Nichola Meserve, MassDMF
Sarah Peake, Rep.
Sarah Ferrara, COS

September 19, 2022

Dear ASMFC Menhaden Management Board,

On behalf of the following organizations, we write to express our support for certain options available to the Board for approval within Draft Addendum I to Amendment 3 of the Atlantic Menhaden Interstate Fishery Management Plan, as follows:

- We support maintaining the 0.5% fixed minimum quota for each state, with allocation based off landings data from the 2018, 2019, and 2021 timeframe.
- We support increasing the episodic events set-aside program to 5%.
- We support permitted gear types of the IC/SSF provision including only non-directed gears, a 3,000 lb/day limit for small-scale gear types, and counting all IC/SSF landings against the coastwide TAC.

We would also like to express our concern with certain considerations that do not appear to be included in your deliberations. While the recent single-species stock assessment found the Atlantic menhaden stock to be above the biomass target, *how that biomass is distributed and fished along the coast are important considerations* for sustaining predators, including recovering populations of striped bass and bluefish, that depend on the availability of various year classes of menhaden (and other forage species) throughout their range. We believe that the fishery should be distributed throughout the species' known geographic range, not concentrated in the middle of its range, especially in and near sensitive natal areas like estuaries. Further, the fishery should not be dominated by industrial fisheries, but rather enable the growth of smaller-scale and local commercial and recreational fisheries. Thus, a restructuring of fishery exploitation through the following options will better benefit the overall Atlantic coast ecosystem.

Optimal, sustained fishery catches should reflect the natural age structure of the menhaden population. This would be best achieved by fishing effort that is distributed along the coast, and not concentrated nearshore in sensitive nursery habitats at the center of their range. With the fisheries' effort and catch centered at the menhaden population's natal area and focused on juveniles (ages 0-2), this prevents larger, more fecund individuals from existing in the stock.

With the recent advent and significant growth of small-scale fisheries, it becomes necessary to ensure that these catches are counted toward the coastwide TAC quota. This is simply sound fisheries management.

The decision-making processes involved in: (i) how the TAC is allocated to the states; (ii) the episodic events set-aside; and (iii) incidental catch/small-scale fisheries, are all key to accomplishing stated management priorities.

3.1.1: Allocation options for addressing the minimum allocation: **Option A**

The status quo option which allocates a 0.5% fixed minimum quota to each state is the only equitable utilization of a minimum quota system for each state participating in the interstate fishery management plan. The alternative option penalizes states with low landings and does not account for the benefits that leaving fish in that states' coastal waters could have on their other fisheries (ie: forage for

predators, etc.). States who wish to dedicate their quota to striped bass productivity, for example, should be able to do so, as these fisheries are closely linked coastwide. Furthermore, the alternative option assumes that states with low current landings will not increase their landings in the future, which goes directly against the objective of this section: to adjust allocations to align with the availability of the resource, and to reduce quota transfers.

3.1.2: Timeframes to base allocating the remaining TAC: **Option 2**

Using landings data from 2018, 2019, and 2021 most accurately reflects the current state of the fishery and the availability of the menhaden resource and best meets the addendum objectives. The ISFMP allows the Board to adjust allocation for any changes in the resource or fisheries that may occur in the future through an addendum or amendment process. This will allow the Board to adjust for current landings in the future, in a next reallocation process, to reflect how future landings may look. The current TAC allocation timeframe uses 2009-2011 landings data, which does not reflect the current stock distribution. This updated timeframe does reflect current stock distribution along the entire Atlantic coast.

3.2.1: Increase the Set-Aside: **Option 2 (Sub-Option 1)**

The objective of the EESA program is to ensure that Northeastern states can be flexible regarding episodic changes in menhaden availability. Increasing the flexibility that the Northeastern states have through increasing the EESA program to a static amount of 5%, will give them more autonomy within their states' fisheries and minimize in-season disruptions.

3.3.1: Timing of IC/SSF Provision: **No preferred option**

The options within this section would impact states differently based off other final option choices. It is not clear how this will affect the equitability of each state's fishery if they divide their allocation by sector, fishery, or gear type. The Board should consider equity among states and fisheries when addressing this section, and preservation of the viability of small-scale fisheries throughout the coast.

3.3.2: Permitted Gear Types of the of IC/SSF Provision: **Option 3**

The objective of this section is to address the volume of IC/SSF landings by removing specific gear types. Choosing this option will keep only non-directed gears within the IC/SSF provision, addressing the objective, and making the provision more straightforward regarding gear types. Gear types such as floating fish traps should not be considered together with purse seines, even if the purse seine is smaller than 150 fathoms. This option will create the most equitable definition of the provision's creation in the first place and return it to its original Amendment 2 intentions.

3.3.3: Trip Limit for Directed Small-Scale Fisheries of IC/SSF Provision: **Option 3**

If Option 3 to Section 3.3.2 is chosen, then this section is no longer necessary. However, if another option in Section 3.3.2 is chosen, creating a 3,000 lb/day trip limit for small-scale gear types will achieve the objective of this section: to sufficiently constrain landings to achieve overall management goals. This option will still allow non-directed gear types to land up to 6,000 lbs/day, while moving small-scale directed gear catch lower, to reflect the definition of the 'small-scale' aspect of the fishery more accurately.

3.3.4: Catch Accounting of IC/SSF Provision: **Option 2**

With the recent and significant growth of small-scale fisheries (SSF) comes the responsibility for fishery managers to ensure that their catch is factored into and counts toward the coastwide quota. That all catch should count against the menhaden TAC is a best practice for sound fisheries management. IC/SSF landings should be evaluated against the TAC because while they only account for a small portion of the total, they are still landings within the fishery, and should be considered as such, just as directed landings are. Whether it is a small-scale fishery or an incidental catch fishery should depend in part on whether the catch is counted against quota. In 2021, IC/SSF landings were 13.2 million lbs or 3.1% of the coastwide TAC. This option will address the objective of this section: to create a system where annual IC/SSF landings are limited and there is accountability for overages.

Lastly, we are concerned that because the latest stock assessment update does not include updated data on species which were used to create the ERP targets and thresholds, the setting of the coastwide TAC for the 2023 season may disregard vital ecosystem effects. The 2021-2022 TAC of 194,400 mt was set with the intention of keeping the fishery below the F target and above the SSB target set using ERP criteria. However, those criteria use species data from terminal year 2017. Therefore, the latest menhaden stock update does not consider the effects of the decline of the Atlantic herring stock, for example, which is a primary alternative prey species to menhaden. The 2022 Atlantic Herring Management Track Assessment concluded that herring remain overfished at just 21% of the target biomass. Within the ecosystem, the depletion of the Atlantic herring resource has likely had wide-ranging effects on both prey and predators since 2017, and these impacts will continue as the resource slowly rebuilds. Resiliency of the ecosystems on which many fisheries depend requires that we carefully consider the impacts of menhaden harvest on the forage base. Just as menhaden are increasingly important as bait to compensate for shortages of Atlantic herring, river herring, and mackerel, so too are they important as a food source for predators. Therefore, *it is imperative that we use a precautionary approach to TAC-setting for the 2023 season*, and consider the current TAC as a maximum value, not as a baseline.

Thank you for your consideration of the desires of the following organizations, representing stakeholders from each state along the Atlantic coast, and thousands of concerned anglers and citizens.

Sincerely,

Jaelyn Higgins

Forage Fish Associate

Theodore Roosevelt Conservation Partnership

Remy Moncrieffe

Policy Manager, Marine Conservation

National Audubon Society

Zach Cockrum

Senior Director, Ocean Sustainability
National Wildlife Federation

Fred Akers

Administrator
Great Egg Harbor Watershed Association

Chad Tokowicz

Government Relations Manager
Marine Retailers Association of the Americas

Sarah Ryan Hudson

Director of Advocacy
Gotham Whale

Bruce Pohlot

Conservation Director
International Game Fish Association

Greg Vespe

Executive Director
The Rhode Island Saltwater Anglers Association

Michael Waine

Atlantic Fisheries Policy Director
American Sportfishing Association

Steve Atkinson

President
Virginia Saltwater Sportfishing Association

Pam Lyons Gromen

Executive Director
Wild Oceans

John Duane

Fisheries Advocate
Wellfleet Natural Resources Advisory Board

Kellie Ralston

VP Conservation and Public Policy
Bonefish Tarpon Trust

George Jackman

Senior Habitat Restoration Manager
Riverkeeper, Inc.

Capt. Paul Eidman

Founder
Menhaden Defenders

James Boyle

From: Stephanie Choate <stephosgood@gmail.com>
Sent: Monday, September 26, 2022 8:55 AM
To: Comments
Subject: [External] Atlantic Menhaden Draft Addendum I: WO

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Auto Replied

Dear Mr. Boyle,

Dear ASMFC Atlantic Menhaden Management Board,

Thank you for the opportunity to comment on Draft Addendum 1 to Amendment 3 to the Atlantic Menhaden Interstate Fishery Management Plan.

How Atlantic menhaden biomass is distributed and fished along the coast are important considerations for sustaining predators, including recovering populations of striped bass and bluefish, that depend on the availability of various year classes of menhaden (and other forage species) throughout their range. The menhaden fishery should be distributed throughout the species' known geographic range, not concentrated in the middle of its range, especially in and near the Chesapeake Bay, the most important menhaden nursery along the coast.

Of the options presented in the addendum, I support the following options as best meeting the management and conservation needs of this vital forage fish:

- Maintain the 0.5% fixed minimum quota for each state, with allocation based off landings data from the 2018, 2019, and 2021 timeframe. (3.1.1 Option A & 3.1.2 Option 2)
- Increase the episodic events set-aside program to 5%. (3.2.1 Option 2, Sub-Option 1)
- Include only non-directed gears in the list of permitted gear types for the Incidental Catch (IC) and Small-Scale Fisheries (SSF) provision and implement a 3,000 lb/day limit for small-scale gear types. (3.3.2 Option 3 & 3.3.3 Option 3)
- Count all IC/SSF landings against the coastwide Total Allowable Catch (TAC). (3.3.4 Option 2)

Finally, I am concerned that because the latest single-species stock assessment update does not include updated data on species that were used to generate the ecological reference points (ERPS), including overfished Atlantic herring, the coastwide TAC should be held at 194,400 mt until an updated Ecological Reference Points Stock Assessment is completed.

Thank you for taking my comments into consideration.

Sincerely,
Stephanie Choate
3136 S Madison Ave
Tulsa, OK 74105

James Boyle

From: James Keelen <jim.keelen2228@gmail.com>
Sent: Sunday, September 25, 2022 1:06 AM
To: Comments
Subject: [External] Atlantic Menhaden Draft Addendum I: WO

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Auto Replied

Dear Mr. Boyle,

Dear ASMFC Atlantic Menhaden Management Board,

Thank you for the opportunity to comment on Draft Addendum 1 to Amendment 3 to the Atlantic Menhaden Interstate Fishery Management Plan.

How Atlantic menhaden biomass is distributed and fished along the coast are important considerations for sustaining predators, including recovering populations of striped bass and bluefish, that depend on the availability of various year classes of menhaden (and other forage species) throughout their range. The menhaden fishery should be distributed throughout the species' known geographic range, not concentrated in the middle of its range, especially in and near the Chesapeake Bay, the most important menhaden nursery along the coast.

Of the options presented in the addendum, I support the following options as best meeting the management and conservation needs of this vital forage fish:

- Maintain the 0.5% fixed minimum quota for each state, with allocation based off landings data from the 2018, 2019, and 2021 timeframe. (3.1.1 Option A & 3.1.2 Option 2)
- Increase the episodic events set-aside program to 5%. (3.2.1 Option 2, Sub-Option 1)
- Include only non-directed gears in the list of permitted gear types for the Incidental Catch (IC) and Small-Scale Fisheries (SSF) provision and implement a 3,000 lb/day limit for small-scale gear types. (3.3.2 Option 3 & 3.3.3 Option 3)
- Count all IC/SSF landings against the coastwide Total Allowable Catch (TAC). (3.3.4 Option 2)

Finally, I am concerned that because the latest single-species stock assessment update does not include updated data on species that were used to generate the ecological reference points (ERPS), including overfished Atlantic herring, the coastwide TAC should be held at 194,400 mt until an updated Ecological Reference Points Stock Assessment is completed.

Thank you for taking my comments into consideration.

Sincerely,
James Keelen
1212 Tatamy Rd
Easton, PA 18045

James Boyle

From: Robert Egger <tuckermarine@gmail.com>
Sent: Saturday, September 24, 2022 10:46 PM
To: Comments
Subject: [External] Atlantic Menhaden Draft Addendum I: WO

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Auto Replied

Dear Mr. Boyle,

Dear ASMFC Atlantic Menhaden Management Board,

Thank you for the opportunity to comment on Draft Addendum 1 to Amendment 3 to the Atlantic Menhaden Interstate Fishery Management Plan.

How Atlantic menhaden biomass is distributed and fished along the coast are important considerations for sustaining predators, including recovering populations of striped bass and bluefish, that depend on the availability of various year classes of menhaden (and other forage species) throughout their range. The menhaden fishery should be distributed throughout the species' known geographic range, not concentrated in the middle of its range, especially in and near the Chesapeake Bay, the most important menhaden nursery along the coast.

Of the options presented in the addendum, I support the following options as best meeting the management and conservation needs of this vital forage fish:

- Maintain the 0.5% fixed minimum quota for each state, with allocation based off landings data from the 2018, 2019, and 2021 timeframe. (3.1.1 Option A & 3.1.2 Option 2)
- Increase the episodic events set-aside program to 5%. (3.2.1 Option 2, Sub-Option 1)
- Include only non-directed gears in the list of permitted gear types for the Incidental Catch (IC) and Small-Scale Fisheries (SSF) provision and implement a 3,000 lb/day limit for small-scale gear types. (3.3.2 Option 3 & 3.3.3 Option 3)
- Count all IC/SSF landings against the coastwide Total Allowable Catch (TAC). (3.3.4 Option 2)

Finally, I am concerned that because the latest single-species stock assessment update does not include updated data on species that were used to generate the ecological reference points (ERPS), including overfished Atlantic herring, the coastwide TAC should be held at 194,400 mt until an updated Ecological Reference Points Stock Assessment is completed.

Thank you for taking my comments into consideration.

Sincerely,
Robert Egger
1936 Seaman Ct
Toms River, NJ 08753

James Boyle

From: Donald T Reilly <domotoreilly@verizon.net>
Sent: Tuesday, September 20, 2022 3:51 PM
To: Comments
Subject: [External] Atlantic Menhaden Draft Addendum I: WO

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Auto Replied

Dear Mr. Boyle,

Dear ASMFC Atlantic Menhaden Management Board,

Thank you for the opportunity to comment on Draft Addendum 1 to Amendment 3 to the Atlantic Menhaden Interstate Fishery Management Plan.

How Atlantic menhaden biomass is distributed and fished along the coast are important considerations for sustaining predators, including recovering populations of striped bass and bluefish, that depend on the availability of various year classes of menhaden (and other forage species) throughout their range. The menhaden fishery should be distributed throughout the species' known geographic range, not concentrated in the middle of its range, especially in and near the Chesapeake Bay, the most important menhaden nursery along the coast.

Of the options presented in the addendum, I support the following options as best meeting the management and conservation needs of this vital forage fish:

- Maintain the 0.5% fixed minimum quota for each state, with allocation based off landings data from the 2018, 2019, and 2021 timeframe. (3.1.1 Option A & 3.1.2 Option 2)
- Increase the episodic events set-aside program to 5%. (3.2.1 Option 2, Sub-Option 1)
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Thank you for taking my comments into consideration.

Sincerely,
Donald T Reilly
128 Bradford St
Needham, MA 02492

James Boyle

From: John Moy <jmoy@ospf.org>
Sent: Monday, September 19, 2022 6:21 PM
To: Comments
Subject: [External] Atlantic Menhaden Draft Addendum I: WO

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Auto Replied

Dear Mr. Boyle,

Dear ASMFC Atlantic Menhaden Management Board,

Thank you for the opportunity to comment on Draft Addendum 1 to Amendment 3 to the Atlantic Menhaden Interstate Fishery Management Plan.

How Atlantic menhaden biomass is distributed and fished along the coast are important considerations for sustaining predators, including recovering populations of striped bass and bluefish, that depend on the availability of various year classes of menhaden (and other forage species) throughout their range. The menhaden fishery should be distributed throughout the species' known geographic range, not concentrated in the middle of its range, especially in and near the Chesapeake Bay, the most important menhaden nursery along the coast.

Of the options presented in the addendum, I support the following options as best meeting the management and conservation needs of this vital forage fish:

- Maintain the 0.5% fixed minimum quota for each state, with allocation based off landings data from the 2018, 2019, and 2021 timeframe. (3.1.1 Option A & 3.1.2 Option 2)
- Increase the episodic events set-aside program to 5%. (3.2.1 Option 2, Sub-Option 1)
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- Count all IC/SSF landings against the coastwide Total Allowable Catch (TAC). (3.3.4 Option 2)

Finally, I am concerned that because the latest single-species stock assessment update does not include updated data on species that were used to generate the ecological reference points (ERPS), including overfished Atlantic herring, the coastwide TAC should be held at 194,400 mt until an updated Ecological Reference Points Stock Assessment is completed.

Thank you for taking my comments into consideration.

Sincerely,
John Moy
25 Eel Point Road
Nantucket, MA 02554

James Boyle

From: PAUL EWING <pf6262@aol.com>
Sent: Monday, September 19, 2022 9:40 AM
To: Comments
Subject: [External] Atlantic Menhaden Draft Addendum I: WO

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Auto Replied

Dear Mr. Boyle,

Dear ASMFC Atlantic Menhaden Management Board,

Thank you for the opportunity to comment on Draft Addendum 1 to Amendment 3 to the Atlantic Menhaden Interstate Fishery Management Plan.

How Atlantic menhaden biomass is distributed and fished along the coast are important considerations for sustaining predators, including recovering populations of striped bass and bluefish, that depend on the availability of various year classes of menhaden (and other forage species) throughout their range. The menhaden fishery should be distributed throughout the species' known geographic range, not concentrated in the middle of its range, especially in and near the Chesapeake Bay, the most important menhaden nursery along the coast. GET THE MENHADEN FISHERY OUT OF THE CHESAPEAKE BAY AND QUIT KICKING THE CAN DOWN THE ROAD AS YOU HAVE DONE FOR OVER 20 YEARS!! I HAVE THE RECORDS TO PROVE THE PAST RECORD OF ASMFC.

Of the options presented in the addendum, I support the following options as best meeting the management and conservation needs of this vital forage fish:

- Maintain the 0.5% fixed minimum quota for each state, with allocation based off landings data from the 2018, 2019, and 2021 timeframe. (3.1.1 Option A & 3.1.2 Option 2)
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Thank you for taking my comments into consideration.

Sincerely,
PAUL EWING

FISHING FEVER
Virginia Beach, VA 23451

James Boyle

From: Francis Weld <frankiedubs@icloud.com>
Sent: Sunday, September 18, 2022 6:04 AM
To: Comments
Subject: [External] Atlantic Menhaden Draft Addendum I: WO

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Auto Replied

Dear Mr. Boyle,

Dear ASMFC Atlantic Menhaden Management Board,

Thank you for the opportunity to comment on Draft Addendum 1 to Amendment 3 to the Atlantic Menhaden Interstate Fishery Management Plan.

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Thank you for taking my comments into consideration.

Sincerely,
Francis Weld
PO Boix 595
Northeast Harbor, ME 04662

James Boyle

From: Bill Rogers <billretired4ever@yahoo.com>
Sent: Sunday, September 18, 2022 4:52 AM
To: Comments
Subject: [External] Atlantic Menhaden Draft Addendum I: WO

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Auto Replied

Dear Mr. Boyle,

Dear ASMFC Atlantic Menhaden Management Board,

Thank you for the opportunity to comment on Draft Addendum 1 to Amendment 3 to the Atlantic Menhaden Interstate Fishery Management Plan.

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Thank you for taking my comments into consideration.

Sincerely,
Bill Rogers
109 fort walker lane
bluffton, SC 29909

James Boyle

From: Ronald Meza <ronaldmeza10@gmail.com>
Sent: Sunday, September 18, 2022 1:32 AM
To: Comments
Subject: [External] Atlantic Menhaden Draft Addendum I: WO

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Auto Replied

Dear Mr. Boyle,

Dear ASMFC Atlantic Menhaden Management Board,

Thank you for the opportunity to comment on Draft Addendum 1 to Amendment 3 to the Atlantic Menhaden Interstate Fishery Management Plan.

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I also ask that the company

Omega be investigated and banned from taking any menhaden in American waters. They habitually over fish and destroy our natural stocks of menhaden which destroys the food chain and ecosystem.

Thank you for taking my comments into consideration.

Sincerely,

Ronald Meza
842 Stratmill Road
Binghamton, NY 13904

James Boyle

From: Stephen Richter <wahooslayer89@comcast.net>
Sent: Saturday, September 17, 2022 8:57 PM
To: Comments
Subject: [External] Atlantic Menhaden Draft Addendum I: WO

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Auto Replied

Dear Mr. Boyle,

Dear ASMFC Atlantic Menhaden Management Board,

Thank you for the opportunity to comment on Draft Addendum 1 to Amendment 3 to the Atlantic Menhaden Interstate Fishery Management Plan.

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Thank you for taking my comments into consideration.

Sincerely,
Stephen Richter
577 Atsion Road
Shamong, NJ 08088

James Boyle

From: Ron Silver <rhinopias@comcast.net>
Sent: Saturday, September 17, 2022 9:20 AM
To: Comments
Subject: [External] Atlantic Menhaden Draft Addendum I: WO

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Auto Replied

Dear Mr. Boyle,

Dear ASMFC Atlantic Menhaden Management Board,

Thank you for the opportunity to comment on Draft Addendum 1 to Amendment 3 to the Atlantic Menhaden Interstate Fishery Management Plan.

How Atlantic menhaden biomass is distributed and fished along the coast are important considerations for sustaining predators, including recovering populations of striped bass and bluefish, that depend on the availability of various year classes of menhaden (and other forage species) throughout their range. The menhaden fishery should be distributed throughout the species' known geographic range, not concentrated in the middle of its range, especially in and near the Chesapeake Bay, the most important menhaden nursery along the coast.

Of the options presented in the addendum, I support the following options as best meeting the management and conservation needs of this vital forage fish:

- Maintain the 0.5% fixed minimum quota for each state, with allocation based off landings data from the 2018, 2019, and 2021 timeframe. (3.1.1 Option A & 3.1.2 Option 2)
- Increase the episodic events set-aside program to 5%. (3.2.1 Option 2, Sub-Option 1)
- Include only non-directed gears in the list of permitted gear types for the Incidental Catch (IC) and Small-Scale Fisheries (SSF) provision and implement a 3,000 lb/day limit for small-scale gear types. (3.3.2 Option 3 & 3.3.3 Option 3)
- Count all IC/SSF landings against the coastwide Total Allowable Catch (TAC). (3.3.4 Option 2)

Finally, I am concerned that because the latest single-species stock assessment update does not include updated data on species that were used to generate the ecological reference points (ERPS), including overfished Atlantic herring, the coastwide TAC should be held at 194,400 mt until an updated Ecological Reference Points Stock Assessment is completed.

Thank you for taking my comments into consideration.

Sincerely,
Ron Silver
1829 Sea Oats Dr
Atlantic Beach, FL 32233

James Boyle

From: Margaret Silver <cattleya@comcast.net>
Sent: Saturday, September 17, 2022 9:20 AM
To: Comments
Subject: [External] Atlantic Menhaden Draft Addendum I: WO

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Auto Replied

Dear Mr. Boyle,

Dear ASMFC Atlantic Menhaden Management Board,

Thank you for the opportunity to comment on Draft Addendum 1 to Amendment 3 to the Atlantic Menhaden Interstate Fishery Management Plan.

How Atlantic menhaden biomass is distributed and fished along the coast are important considerations for sustaining predators, including recovering populations of striped bass and bluefish, that depend on the availability of various year classes of menhaden (and other forage species) throughout their range. The menhaden fishery should be distributed throughout the species' known geographic range, not concentrated in the middle of its range, especially in and near the Chesapeake Bay, the most important menhaden nursery along the coast.

Of the options presented in the addendum, I support the following options as best meeting the management and conservation needs of this vital forage fish:

- Maintain the 0.5% fixed minimum quota for each state, with allocation based off landings data from the 2018, 2019, and 2021 timeframe. (3.1.1 Option A & 3.1.2 Option 2)
- Increase the episodic events set-aside program to 5%. (3.2.1 Option 2, Sub-Option 1)
- Include only non-directed gears in the list of permitted gear types for the Incidental Catch (IC) and Small-Scale Fisheries (SSF) provision and implement a 3,000 lb/day limit for small-scale gear types. (3.3.2 Option 3 & 3.3.3 Option 3)
- Count all IC/SSF landings against the coastwide Total Allowable Catch (TAC). (3.3.4 Option 2)

Finally, I am concerned that because the latest single-species stock assessment update does not include updated data on species that were used to generate the ecological reference points (ERPS), including overfished Atlantic herring, the coastwide TAC should be held at 194,400 mt until an updated Ecological Reference Points Stock Assessment is completed.

Thank you for taking my comments into consideration.

Sincerely,
Margaret Silver
1829 Sea Oats Dr
Atlantic Beach, FL 32233

James Boyle

From: Ken Warchal <kmwarchal@aol.com>
Sent: Saturday, September 17, 2022 8:52 AM
To: Comments
Subject: [External] Atlantic Menhaden Draft Addendum I: WO

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Auto Replied

Dear Mr. Boyle,

Dear ASMFC Atlantic Menhaden Management Board,

Thank you for the opportunity to comment on Draft Addendum 1 to Amendment 3 to the Atlantic Menhaden Interstate Fishery Management Plan.

How Atlantic menhaden biomass is distributed and fished along the coast are important considerations for sustaining predators, including recovering populations of striped bass and bluefish, that depend on the availability of various year classes of menhaden (and other forage species) throughout their range. The menhaden fishery should be distributed throughout the species' known geographic range, not concentrated in the middle of its range, especially in and near the Chesapeake Bay, the most important menhaden nursery along the coast.

Of the options presented in the addendum, I support the following options as best meeting the management and conservation needs of this vital forage fish:

- Maintain the 0.5% fixed minimum quota for each state, with allocation based off landings data from the 2018, 2019, and 2021 timeframe. (3.1.1 Option A & 3.1.2 Option 2)
- Increase the episodic events set-aside program to 5%. (3.2.1 Option 2, Sub-Option 1)
- Include only non-directed gears in the list of permitted gear types for the Incidental Catch (IC) and Small-Scale Fisheries (SSF) provision and implement a 3,000 lb/day limit for small-scale gear types. (3.3.2 Option 3 & 3.3.3 Option 3)
- Count all IC/SSF landings against the coastwide Total Allowable Catch (TAC). (3.3.4 Option 2)

Finally, I am concerned that because the latest single-species stock assessment update does not include updated data on species that were used to generate the ecological reference points (ERPS), including overfished Atlantic herring, the coastwide TAC should be held at 194,400 mt until an updated Ecological Reference Points Stock Assessment is completed.

Thank you for taking my comments into consideration.

Sincerely,
Ken Warchal
17 Bay Point Harbour
POINT PLEASANT Boro, NJ 08742

James Boyle

From: kevin marshall <k-marshall@comcast.net>
Sent: Saturday, September 17, 2022 6:55 AM
To: Comments
Subject: [External] Atlantic Menhaden Draft Addendum I: WO

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Auto Replied

Dear Mr. Boyle,

Dear ASMFC Atlantic Menhaden Management Board,

Thank you for the opportunity to comment on Draft Addendum 1 to Amendment 3 to the Atlantic Menhaden Interstate Fishery Management Plan.

How Atlantic menhaden biomass is distributed and fished along the coast are important considerations for sustaining predators, including recovering populations of striped bass and bluefish, that depend on the availability of various year classes of menhaden (and other forage species) throughout their range. The menhaden fishery should be distributed throughout the species' known geographic range, not concentrated in the middle of its range, especially in and near the Chesapeake Bay, the most important menhaden nursery along the coast.

Of the options presented in the addendum, I support the following options as best meeting the management and conservation needs of this vital forage fish:

- Maintain the 0.5% fixed minimum quota for each state, with allocation based off landings data from the 2018, 2019, and 2021 timeframe. (3.1.1 Option A & 3.1.2 Option 2)
- Increase the episodic events set-aside program to 5%. (3.2.1 Option 2, Sub-Option 1)
- Include only non-directed gears in the list of permitted gear types for the Incidental Catch (IC) and Small-Scale Fisheries (SSF) provision and implement a 3,000 lb/day limit for small-scale gear types. (3.3.2 Option 3 & 3.3.3 Option 3)
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Finally, I am concerned that because the latest single-species stock assessment update does not include updated data on species that were used to generate the ecological reference points (ERPS), including overfished Atlantic herring, the coastwide TAC should be held at 194,400 mt until an updated Ecological Reference Points Stock Assessment is completed.

Thank you for taking my comments into consideration.

Sincerely,
kevin marshall
282 Old Oaken Bucket Road
Scituate, MA 02066

James Boyle

From: Robert Ballance <oghbob@yahoo.com>
Sent: Friday, September 16, 2022 6:47 PM
To: Comments
Subject: [External] Atlantic Menhaden Draft Addendum I: WO

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Auto Replied

Dear Mr. Boyle,

Dear ASMFC Atlantic Menhaden Management Board,

Thank you for the opportunity to comment on Draft Addendum 1 to Amendment 3 to the Atlantic Menhaden Interstate Fishery Management Plan.

As an avid Striped Bass fisherman, I'm concerned with the total biomass of bait fish for the stripers and Blue fish. I note that the alternative to the Menhaden as the major prey of the stripers and Blue fish is the Atlantic Herring which is at only 21% of desired biomass.. Any increase of the Menhaden harvest will keep pressure on the Atlantic Herring. This will also increase the recovery time for the stripers and Blue fish. Please do not increase the Menhaden harvest.

Of the options presented in the addendum, I support the following options as best meeting the management and conservation needs of this vital forage fish:

- Maintain the 0.5% fixed minimum quota for each state, with allocation based off landings data from the 2018, 2019, and 2021 timeframe. (3.1.1 Option A & 3.1.2 Option 2)
- Increase the episodic events set-aside program to 5%. (3.2.1 Option 2, Sub-Option 1)
- Include only non-directed gears in the list of permitted gear types for the Incidental Catch (IC) and Small-Scale Fisheries (SSF) provision and implement a 3,000 lb/day limit for small-scale gear types. (3.3.2 Option 3 & 3.3.3 Option 3)
- Count all IC/SSF landings against the coastwide Total Allowable Catch (TAC). (3.3.4 Option 2)

Finally, I am concerned that because the latest single-species stock assessment update does not include updated data on species that were used to generate the ecological reference points (ERPS), including overfished Atlantic herring, the coastwide TAC should be held at 194,400 mt until an updated Ecological Reference Points Stock Assessment is completed.

Thank you for taking my comments into consideration.

Sincerely,
Robert Ballance
179 W Lake Shore Drive
Rockaway, NJ 07866

James Boyle

From: Robert Pollard <rbpollard46@comcast.net>
Sent: Friday, September 16, 2022 5:44 PM
To: Comments
Subject: [External] Atlantic Menhaden Draft Addendum I: WO

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Auto Replied

Dear Mr. Boyle,

Dear ASMFC Atlantic Menhaden Management Board,

Thank you for the opportunity to comment on Draft Addendum 1 to Amendment 3 to the Atlantic Menhaden Interstate Fishery Management Plan.

How Atlantic menhaden biomass is distributed and fished along the coast are important considerations for sustaining predators, including recovering populations of striped bass and bluefish, that depend on the availability of various year classes of menhaden (and other forage species) throughout their range. The menhaden fishery should be distributed throughout the species' known geographic range, not concentrated in the middle of its range, especially in and near the Chesapeake Bay, the most important menhaden nursery along the coast.

Of the options presented in the addendum, I support the following options as best meeting the management and conservation needs of this vital forage fish:

- Maintain the 0.5% fixed minimum quota for each state, with allocation based off landings data from the 2018, 2019, and 2021 timeframe. (3.1.1 Option A & 3.1.2 Option 2)
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Thank you for taking my comments into consideration.

Sincerely,
Robert Pollard
212 Colony Lake Drive
Richmond, VA 23238

James Boyle

From: Linda Gromen <lgromen@aol.com>
Sent: Friday, September 16, 2022 4:35 PM
To: Comments
Subject: [External] Atlantic Menhaden Draft Addendum I: WO

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Auto Replied

Dear Mr. Boyle,

Dear ASMFC Atlantic Menhaden Management Board,

Thank you for the opportunity to comment on Draft Addendum 1 to Amendment 3 to the Atlantic Menhaden Interstate Fishery Management Plan.

How Atlantic menhaden biomass is distributed and fished along the coast are important considerations for sustaining predators, including recovering populations of striped bass and bluefish, that depend on the availability of various year classes of menhaden (and other forage species) throughout their range. The menhaden fishery should be distributed throughout the species' known geographic range, not concentrated in the middle of its range, especially in and near the Chesapeake Bay, the most important menhaden nursery along the coast.

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Thank you for taking my comments into consideration.

Sincerely,
Linda Gromen
509 E State Rd
Cleves, OH 45002

James Boyle

From: Bernard Kepshire <bmkjr@yahoo.com>
Sent: Friday, September 16, 2022 4:07 PM
To: Comments
Subject: [External] Atlantic Menhaden Draft Addendum I: WO

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Auto Replied

Dear Mr. Boyle,

Dear ASMFC Atlantic Menhaden Management Board,

Thank you for the opportunity to comment on Draft Addendum 1 to Amendment 3 to the Atlantic Menhaden Interstate Fishery Management Plan.

How Atlantic menhaden biomass is distributed and fished along the coast are important considerations for sustaining predators, including recovering populations of striped bass and bluefish, that depend on the availability of various year classes of menhaden (and other forage species) throughout their range. The menhaden fishery should be distributed throughout the species' known geographic range, not concentrated in the middle of its range, especially in and near the Chesapeake Bay, the most important menhaden nursery along the coast.

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- Maintain the 0.5% fixed minimum quota for each state, with allocation based off landings data from the 2018, 2019, and 2021 timeframe. (3.1.1 Option A & 3.1.2 Option 2)
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Thank you for taking my comments into consideration.

Sincerely,
Bernard Kepshire
1545 NW Maple Avenue
Corvallis, OR 97330

James Boyle

From: Norman Baker <ntbakerphd@gmail.com>
Sent: Friday, September 16, 2022 4:05 PM
To: Comments
Subject: [External] Atlantic Menhaden Draft Addendum I: WO

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Auto Replied

Dear Mr. Boyle,

Dear ASMFC Atlantic Menhaden Management Board,

Thank you for the opportunity to comment on Draft Addendum 1 to Amendment 3 to the Atlantic Menhaden Interstate Fishery Management Plan.

How Atlantic menhaden biomass is distributed and fished along the coast are important considerations for sustaining predators, including recovering populations of striped bass and bluefish, that depend on the availability of various year classes of menhaden (and other forage species) throughout their range. The menhaden fishery should be distributed throughout the species' known geographic range, not concentrated in the middle of its range, especially in and near the Chesapeake Bay, the most important menhaden nursery along the coast.

Of the options presented in the addendum, I support the following options as best meeting the management and conservation needs of this vital forage fish:

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- Increase the episodic events set-aside program to 5%. (3.2.1 Option 2, Sub-Option 1)
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Thank you for taking my comments into consideration.

Sincerely,
Norman Baker
3789 Lost Mountain Road
Sequim, WA 98382

James Boyle

From: Rob Kramer <rkramer@wildoceans.org>
Sent: Wednesday, September 14, 2022 8:45 AM
To: Comments
Subject: [External] Atlantic Menhaden Draft Addendum I: WO

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Auto Replied

Dear Mr. Boyle,

Dear ASMFC Atlantic Menhaden Management Board,

Thank you for the opportunity to comment on Draft Addendum 1 to Amendment 3 to the Atlantic Menhaden Interstate Fishery Management Plan.

How Atlantic menhaden biomass is distributed and fished along the coast are important considerations for sustaining predators, including recovering populations of striped bass and bluefish, that depend on the availability of various year classes of menhaden (and other forage species) throughout their range. The menhaden fishery should be distributed throughout the species' known geographic range, not concentrated in the middle of its range, especially in and near the Chesapeake Bay, the most important menhaden nursery along the coast.

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- Increase the episodic events set-aside program to 5%. (3.2.1 Option 2, Sub-Option 1)
- Include only non-directed gears in the list of permitted gear types for the Incidental Catch (IC) and Small-Scale Fisheries (SSF) provision and implement a 3,000 lb/day limit for small-scale gear types. (3.3.2 Option 3 & 3.3.3 Option 3)
- Count all IC/SSF landings against the coastwide Total Allowable Catch (TAC). (3.3.4 Option 2)

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Thank you for taking my comments into consideration.

Sincerely,
Rob Kramer
PO Box 272122
Tampa, FL 33688

James Boyle

From: Mike Cota <educationfree@yahoo.com>
Sent: Friday, September 30, 2022 8:58 PM
To: Comments
Subject: [External] Atlantic menhaden draft addendum 1

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Auto Replied

Email to comments@asmfc.org

Subject line: hi my name is Mike Cota and I'm from Harpswell Maine. I'm a lobsterman on the coast of Maine. I use fresh caught menhaden to bait my own traps. Maine has been under a bait shortage for many years now, we have been fortunate to have a great menhaden resource right here at our doorstep but unfortunately have been extremely limited on how we can utilize this resource because of our very small quota. It pains me to see Maine fishermen being forced to bait their traps with non native species along with non oceanic species such as pig, because its the only thing available. Meanwhile we fishermen drive past schools of menhaden in our harbors unable to harvest them. With our current situation we are forced to buy out of state bait that is extremely expensive.

I would like to point out that when menhaden are harvested for bait, they are put back into the ocean and once again absorbed by the sea. Lobsters are not the only creature who benefits from our bait, as it breaks down tiny particles drift out of our traps and are eaten by small fish and many more species. I believe it is outrageous for Virginia "OMEGA PROTIEEN" to hold OVER 78% OF THE ENTIRE EAST COAST QUOTA. I do not believe reduction fishing does anything to help the ecosystem and its cycle of life, and more quota should be set aside for bait purposes only. How is it allowed in America that one company controls 78% of the entire east coast resource? This is ridiculous.

3.1. Quota Allocation

3.1.1- I ask you select Option B, quota's should be based on fish availability and need.

3.1.2- I ask you select Option 4A. I believe a moving average based on the most current years data is the best way to address menhaden availability as well as need. I do not believe using data that's 10 to 12 years old will address the needs of today's fishery. This current year Maine's menhaden fishery, including small scale fishery closed August 28th, that's approximately 2 months before the fish make their seasonal migration out of our waters. Since the closure Maine has once again been importing out of state bait.

3.2 Episodic Set Aside Program

I ask you select Option 2. Increasing the episodic set aside quota will help states like mine that have a great need as well as great resource locally. It will also reduce burden of timely Quota transfers.

3.3 Incidental/ Small Scale Fishery

3.3.1- Timing, I ask you select Option 1 status quo, we rely on the small scale fishery immediately to continue a supply of fresh local menhaden.

3.3.2- Gear Type, I ask you select Option 1 status quo, small purse seines are an important tool to insure only a specific amount of fish are harvested. I'm shocked there is even a conversation about eliminating purse seines and forcing us to use Gillnets, as gill nets kill everything they catch.

3.3.3- Trip Limits I ask you select Option 1 status quo. Any reduction in trip limits would put more pressure on our already evident bait shortage in Maine. It would also cut menhaden harvesters profit down to a point where it would not be feasible to fish.

3.3.4- I ask you select Option 1 status quo, IC/SSF should not be counted towards state allocation or coastwise TAC, we are talking about such a small percentage of harvest done by small independent fishermen.

Sent from my iPhone

James Boyle

From: Kati Clemons <clemfamsix@gmail.com>
Sent: Friday, September 30, 2022 8:38 PM
To: Comments
Subject: [External] Atlantic Menhaden Draft addendum 1

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Auto Replied

Hello,

My name is Kati Clemons and I am from Harpswell, Maine. I am an elver fisherman and the wife of a lobsterman/menhaden harvester. I am the mother of four young daughters, who are being raised in a fishing town and who's hearts and souls belong to the sea. This community and lifestyle is all my children have known, literally since they were in utero.

I cannot even begin to summarize the pain and hardships that the recent inflation of fuel, supplies, labor and bait have created for all local (and statewide) fishermen and women. Maine has been under a bait shortage for many years now. Maine has been fortunate enough to have a great menhaden resource right here at our doorstep; however unfortunately have been limited to how we can utilize this resource because of the very small quota.

It breaks my heart to witness my husband and all Maine fishermen being forced to bait their traps with non native species along with non oceanic species such as pig, because its the only thing available. Meanwhile, the fishermen drive past schools of menhaden in our harbors and are unable to harvest them.

Please allow Maine to increase their menhaden quota. Please allow the honest men and women to do their jobs and do them efficiently. Please allow this legacy, that has been passed down for generations, to continue.

3.1. Quota Allocation

3.1.1- I ask you select Option B, quota's should be based on fish availability and need.

3.1.2- I ask you select Option 4A. I believe a moving average based on the most current years data is the best way to address menhaden availability as well as need. I do not believe using data thats 10 to 12 years old will address the needs of todays fishery. This current year Maines menhaden fishery, including small scale fishery closed August 28th, that's approximately 2 months before the fish make their seasonal migration out of our waters. Since the closure Maine has once again been importing out of state bait.

3.2 Episodic Set Aside Program

I ask you select Option 2. Increasing the episodic set aside quota will help states like mine that have a great need as well as great resource locally. It will also reduce burden of timely Quota transfers.

3.3 Incidental/ Small Scale Fishery

3.3.1- Timing, I ask you select Option 1 status quo, we rely on the small scale fishery immedietly to continue a supply of fresh local menhaden.

3.3.2- Gear Type, I ask you select Option 1 status quo, small purse seines are a important tool to insure only a specific amount of fish are harvested. Im shocked there is even a conversation about eliminating purse seines and forcing us to use Gillnets, as gill nets kill everything they catch.

3.3.3- Trip Limits I ask you select Option 1 status quo. Any reduction in trip limits would put more pressure on our already evident bait shortage in Maine. It would also cut menhaden harvesters profit down to a point where it would not be feasible to fish.

3.3.4- I ask you select Option 1 status quo, IC/SSF should not be counted towards state allocation or coastwise TAC, we are talking about such a small percentage of harvest done by small independent fishermen.

Sincerely,
Kati Elaine Clemons
207.522.6629

James Boyle

From: Riley Parlin <rileyparlin@icloud.com>
Sent: Friday, September 30, 2022 7:52 PM
To: Comments
Subject: [External] Atlantic Menhaden Draft Addendum 1

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Green Category, Auto Replied

Email to comments@asmfc.org

Subject line: Atlantic Menhaden Draft addendum 1

Hello my name is Riley Parlin and I am a lobsterman and a menhaden harvester.

3.1. Quota Allocation

3.1.1 - I ask you select Option B, quota's should be based on fish availability and need.

3.1.2- I ask you select Option 4A. I believe a moving average based on the most current years data is the best way to address menhaden availability as well as need. I do not believe using data that's 10 to 12 years old will address the needs of today's fishery that is just ridiculous in my eyes. This current year Maine's menhaden fishery, including small scale fishery closed August 28th, that's approximately 2 months before the fish make their seasonal migration out of our waters. Since the closure Maine has once again been importing out of state bait.

3.2 Episodic Set Aside Program

I ask you select Option 2. Increasing the episodic set aside quota will help states like mine that have a great need as well as great resource locally. It will also reduce burden of timely Quota transfers.

3.3 Incidental/ Small Scale Fishery

3.3.1- Timing, I ask you select Option 1 status quo, we rely on the small scale fishery immediately to continue a supply of fresh local menhaden for us and for other working wharfs around where I am from.

3.3.2- Gear Type, I ask you select Option 1 status quo, small purse seines are an important tool to insure only a specific amount of fish are harvested. I'm shocked there is even a conversation about eliminating purse seines and forcing us to use Gillnets, as gill nets kill everything they catch and purse seines you can let fish go without killing them like a gill net does.

3.3.3- Trip Limits I ask you select Option 1 status quo. Any reduction in trip limits would put more pressure on our already evident bait shortage in Maine. It would also cut menhaden harvesters profit down to a point where it would not be feasible to fish.

3.3.4- I ask you select Option 1 status quo, IC/SSF should not be counted towards state allocation or coastwise TAC, we are talking about such a small percentage of harvest done by small independent fishermen.

Sent from my iPhone

James Boyle

From: fvdeduction@gmail.com
Sent: Friday, September 30, 2022 7:06 PM
To: Comments
Subject: [External] Menhaden

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Auto Replied

Email to comments@asmfc.org

Subject line: Atlantic Menhaden Draft addendum 1

Hello my name is Sean Clemons and I'm from Harpswell Maine. I'm a lobsterman as well as a menhaden harvester. I use fresh caught menhaden to bait my own traps as well as sell fresh menhaden to many local fishing wharfs. Maine has been under a bait shortage for many years now, we have been fortunate to have a great menhaden resource right here at our doorstep but unfortunately have been extremely limited on how we can utilize this resource because of our very small quota. It pains me to see Maine fishermen being forced to bait their traps with non native species along with non oceanic species such as pig, because its the only thing available. Meanwhile we fishermen drive past schools of menhaden in our harbors unable to harvest them. With our current situation we are forced to buy out of state bait that is extremely expensive.

I would like to point out that when menhaden are harvested for bait, they are put back into the ocean and once again absorbed by the sea. Lobsters are not the only creature who benefits from our bait, as it breaks down tiny particles drift out of our traps and are eaten by small fish etc... I believe it is outrageous for Virginia "OMEGA PROTIEEN" to hold OVER 78% OF THE ENTIRE EAST COAST QUOTA. I do not believe reduction fishing does anything to help the ecosystem and its cycle of life, and more quota should be set aside for bait purposes only. How is it allowed in America that one company controls 78% of the entire east coast resource?

3.1. Quota Allocation

3.1.1 - I ask you select Option B, quota's should be based on fish availability and need.

3.1.2- I ask you select Option 4A. I believe a moving average based on the most current years data is the best way to address menhaden availability as well as need. I do not believe using data that's 10 to 12 years old will address the needs of today's fishery. This current year Maine's menhaden fishery, including small scale fishery closed August 28th, that's approximately 2 months before the fish make their seasonal migration out of our waters. Since the closure Maine has once again been importing out of state bait.

3.2 Episodic Set Aside Program

I ask you select Option 2. Increasing the episodic set aside quota will help states like mine that have a great need as well as great resource locally. It will also reduce burden of timely Quota transfers.

3.3 Incidental/ Small Scale Fishery

3.3.1- Timing, I ask you select Option 1 status quo, we rely on the small scale fishery immediately to continue a supply of fresh local menhaden.

3.3.2- Gear Type, I ask you select Option 1 status quo, small purse seines are an important tool to insure only a specific amount of fish are harvested. I'm shocked there is even a conversation about eliminating purse seines and forcing us to use Gillnets, as gill nets kill everything they catch.

3.3.3- Trip Limits I ask you select Option 1 status quo. Any reduction in trip limits would put more pressure on our already evident bait shortage in Maine. It would also cut menhaden harvesters profit down to a point where it would not be feasible to fish.

3.3.4- I ask you select Option 1 status quo, IC/SSF should not be counted towards state allocation or coastwise TAC, we are talking about such a small percentage of harvest done by small independent fishermen.

Sent from my iPhone

James Boyle

From: Andrew Millar <andrew.millar22@gmail.com>
Sent: Friday, September 30, 2022 5:52 PM
To: Comments
Subject: [External] Atlantic menhaden draft 1 addendum comments

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Auto Replied

3.1. Quota Allocation

3.1.1 - I ask you select Option B, quota's should be based on fish availability and need.

3.1.2- I ask you select Option 4A. I believe a moving average based on the most current years data is the best way to address menhaden availability as well as need. I do not believe using data that's 10 to 12 years old will address the needs of today's fishery. This current year Maine's menhaden fishery, including small scale fishery closed August 28th, that's approximately 2 months before the fish make their seasonal migration out of our waters. Since the closure Maine has once again been importing out of state bait.

3.2 Episodic Set Aside Program

I ask you select Option 2. Increasing the episodic set aside quota will help states like mine that have a great need as well as great resource locally. It will also reduce burden of timely Quota transfers.

3.3 Incidental/ Small Scale Fishery

3.3.1- Timing, I ask you select Option 1 status quo, we rely on the small scale fishery immediately to continue a supply of fresh local menhaden.

3.3.2- Gear Type, I ask you select Option 1 status quo, small purse seines are an important tool to insure only a specific amount of fish are harvested. I'm shocked there is even a conversation about eliminating purse seines and forcing us to use Gillnets, as gill nets kill everything they catch.

3.3.3- Trip Limits I ask you select Option 1 status quo. Any reduction in trip limits would put more pressure on our already evident bait shortage in Maine. It would also cut menhaden harvesters profit down to a point where it would not be feasible to fish.

3.3.4- I ask you select Option 1 status quo, IC/SSF should not be counted towards state allocation or coastwise TAC, we are talking about such a small percentage of harvest done by small independent fishermen.

--

Andrew Millar

Engineer for Boston Towing ('18-Present)

Owner/Founder Heritage Marine Services ('20 - Present)

Engineer for Hornbeck Offshore ('16 - '18)

Engineer for Edison Chouest Offshore ('12-'15)

1st Asst. Engineer Unlimited US Coast Guard License

Chief OSV (no limitations) US Coast Guard License

Owner/Founder of Honey Hole Trap Co. ('14 - Present)

Shoreside Engineer New England Fish Co.

Maine Maritime Academy BS - Marine Engineering Technology

James Boyle

From: cameronthorp19 <cameronthorp19@gmail.com>
Sent: Friday, September 30, 2022 4:13 PM
To: Comments
Subject: [External] Atlantic Menhaden Draft addendum

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Auto Replied

Atlantic Menhaden Draft addendum 1

Hey, my name is Cameron Thorp and I live in Brunswick, Maine.

I'm a commercial tuna fisherman and I also crew for a lobsterman/menhaden harvester.

We use fresh caught menhaden to bait our traps as well as supply fresh menhaden to many local fishing warfs.

It's obvious that Maine has been under a bait shortage for many years now.

We have been fortunate to have a great menhaden resource right here at our doorstep but unfortunately have been extremely limited on how we can utilize this resource because of the very small quota.

It's insane that Maine fishermen are being forced to bait their traps with non native species along with nonmarine species such as pig, as it's the only thing available, meanwhile there's schools of menhaden everywhere in the bay and our harbors.

With the current situation lobsterman are forced to source bait from out of state that is extremely expensive, it makes no sense....

I believe it is outrageous for Virginia " OMEGA PROTIEN"to hold OVER 78% OF THE ENTIRE EAST COAST QUOTA. How is it allowed in America that a multi billion dollar corporation controls 78% of the entire east coast resource, while the small guys suffer?

I do not believe reduction fishing does anything to help the ecosystem and its cycle of life, and more quota should be set aside for bait purposes only.

3.1. Quota Allocation

3.1.1 -I ask you select Option B, quota's should be based on fish availability and need.

3.1.2- I ask you select Option 4A.

I believe a moving average based on the most current years data is the best way to address menhaden availability as well as need.

Using data that's 10 to 12 years old will not address the needs of todays fishery.

This current year Maines menhaden fishery, including small scale fishery closed August 28th, that's approximately 2 months before the fish make their seasonal migration out of our waters. Since the closure Maine has once again been importing out of state bait.

3.2 Episodic Set Aside Program

I ask you select Option 2.

Increasing the episodic set aside quota will help states like mine that have a great need as well as great resource locally. It will also reduce burden of timely Quota transfers.

3.3 Incidental/ Small Scale Fishery

3.3.1- Timing.

I ask you select Option 1 status quo.

We rely on the small scale fishery immediately to continue a supply of fresh local menhaden.

3.3.2- Gear Type, I ask you select Option 1 status quo.

Small purse seines are a important tool to insure only a specific amount of fish are harvested.

I'm shocked there is even a conversation about eliminating purse seines, forcing us to use Gillnets, as gillnets kill everything that goes near them..

3.3.3- Trip Limits I ask you select Option 1 status quo.

Any reduction in trip limits would put more pressure on our already evident bait shortage in Maine.

It would also cut menhaden harvesters profit down to a point where it would not be feasible to fish.

3.3.4- I ask you select Option 1 status quo.

IC/SSF should not be counted towards state allocation or coastwise TAC, we are talking about such a small percentage of harvest done by small independent fishermen.

James Boyle

From: Barbara Quinn <barbaraquinn66@gmail.com>
Sent: Friday, September 30, 2022 4:01 PM
To: Comments
Subject: [External] Atlantic Menhaden Draft addendum 1

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Auto Replied

Hello my name is Thomas Clemons and I'm from Harpswell, Maine. I'm a lobsterman, I have been lobstering for the past 45 years. I use fresh caught menhaden to bait my traps. Maine has been under a bait shortage for many years now, we have been fortunate to have a great menhaden resource right here at our doorstep but unfortunately have been extremely limited on how we can utilize this resource because of the state of Maine's very small quota. It pains me to see Maine fishermen being forced to bait their traps with non native species along with non oceanic species such as pig, because it's the only thing available. Meanwhile we fishermen drive past schools of menhaden in our harbors that are unable to be harvested. With our current situation we are forced to buy out of state bait that is extremely expensive. When menhaden are harvested for bait, they are put back into the ocean and once again absorbed by the sea. Lobsters are not the only creatures who benefit from our bait, as tiny particles drift out of our traps and are eaten by small fish etc... I believe it is outrageous for Virginia " OMEGA PROTIEN"to hold OVER 78% OF THE ENTIRE EAST COAST QUOTA. I do not believe reduction fishing does anything to help the ecosystem and its cycle of life, and more quotas should be set aside for bait purposes only. How is it allowed in America that one company controls 78% of the entire east coast resource? 3.1. Quota Allocation 3.1.1 -I ask you to select Option B, quotas should be based on fish availability and need. 3.1.2- I ask you to select Option 4A. I believe a moving average based on the most current years data is the best way to address menhaden availability as well as need. I do not believe using data that's 10 to 12 years old will address the needs of today's fishery. This current year Maines menhaden fishery, including small scale fishery closed August 28th, that's approximately 2 months before the fish make their seasonal migration out of our waters. Since the closure Maine has once again been importing out of state bait. 3.2 Episodic Set Aside Program I ask you to select Option 2. Increasing the episodic set aside quota will help states like mine that have a great need as well as great resources locally. It will also reduce the burden of timely Quota transfers. 3.3 Incidental/ Small Scale Fishery 3.3.1- Timing, I ask you select Option 1 status quo, we rely on the small scale fishery immediately to continue a supply of fresh local menhaden. 3.3.2- Gear Type, I ask you select Option 1 status quo, small purse seines are a important tool to insure only a specific amount of fish are harvested. I'm shocked there is even a conversation about eliminating purse seines and forcing us to use Gillnets, as gill nets kill everything they catch. 3.3.3- Trip Limits I ask you to select Option 1 status quo. Any reduction in trip limits would put more pressure on our already evident bait shortage in Maine. It would also cut menhaden harvesters profit down to a point where it would not be feasible to fish. 3.3.4- I ask you to select Option 1 status quo, IC/SSF should not be counted towards state allocation or coastwise TAC, we are talking about such a small percentage of harvest done by small independent fishermen.

Sincerely,

Thomas Clemons
Harpswell, Maine

James Boyle

From: Hunter Merryman <huntermerryman@icloud.com>
Sent: Thursday, September 29, 2022 9:50 PM
To: Comments
Subject: [External] Atlantic Menhaden Draft addendum 1

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Auto Replied

Hello my name is Hunter merryman and I'm from Harpswell Maine. I'm a lobstermen as well as a menhaden harvester. I use fresh caught menhaden to bait my own traps as well as sell fresh menhaden to many local fishing warfs. Maine has been under a bait shortage for many years now, we have been fortunate to have a great menhaden resource right here at our doorstep but unfortunately have been extremely limited on how we can utilize this resource because of our very small quota. It pains me to see Maine fishermen being forced to bait their traps with non native species along with non oceanic species such as pig, because its the only thing available. Meanwhile we fishermen drive past schools of menhaden in our harbors unable to harvest them. With our current situation we are forced to buy out of state bait that is extremely expensive.

I would like to point out that when menhaden are harvested for bait, they are put back into the ocean and once again absorbed by the sea. Lobsters are not the only creature who benefits from our bait, as it breaks down tiny particles drift out of our traps and are eaten by small fish etc... I believe it is outrageous for Virginia " OMEGA PROTIEN"to hold OVER 78% OF THE ENTIRE EAST COAST QUOTA. I do not believe reduction fishing does anything to help the ecosystem and its cycle of life, and more quota should be set aside for bait purposes only. How is it allowed in America that one company controls 78% of the entire east coast resource?

3.1. Quota Allocation

3.1.1 - I ask you select Option B, quota's should be based on fish availability and need.

3.1.2- I ask you select Option 4A. I believe a moving average based on the most current years data is the best way to address menhaden availability as well as need. I do not believe using data thats 10 to 12 years old will address the needs of todays fishery. This current year Maines menhaden fishery, including small scale fishery closed August 28th, that's approximately 2 months before the fish make their seasonal migration out of our waters. Since the closure Maine has once again been importing out of state bait.

3.2 Episodic Set Aside Program

I ask you select Option 2. Increasing the episodic set aside quota will help states like mine that have a great need as well as great resource locally. It will also reduce burden of timely Quota transfers.

3.3 Incidental/ Small Scale Fishery

3.3.1- Timing, I ask you select Option 1 status quo, we rely on the small scale fishery immedietly to continue a supply of fresh local menhaden.

3.3.2- Gear Type, I ask you select Option 1 status quo, small purse seines are a important tool to insure only a specific amount of fish are harvested. Im shocked there is even a conversation about eliminating purse seines and forcing us to use Gillnets, as gill nets kill everything they catch.

3.3.3- Trip Limits I ask you select Option 1 status quo. Any reduction in trip limits would put more pressure on our already evident bait shortage in Maine. It would also cut menhaden harvesters profit down to a point where it would not be feasible to fish.

3.3.4- I ask you select Option 1 status quo, IC/SSF should not be counted towards state allocation or coastwise TAC, we are talking about such a small percentage of harvest done by small independent fishermen.

James Boyle

From: Sara Merryman <merryman_5@yahoo.com>
Sent: Thursday, September 29, 2022 9:36 PM
To: Comments
Subject: [External] Atlantic Menhaden Draft addendum 1

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Auto Replied

Email to comments@asmfc.org

Subject line: Atlantic Menhaden Draft addendum 1

Hello my name is Jim Merryman and I'm from Harpswell Maine. I'm a lobsterman as well as a menhaden harvester. I use fresh caught menhaden to bait my own traps as well as sell fresh menhaden to many local fishing warfs. Maine has been under a bait shortage for many years now, we have been fortunate to have a great menhaden resource right here at our doorstep but unfortunately have been extremely limited on how we can utilize this resource because of our very small quota. It pains me to see Maine fishermen being forced to bait their traps with non native species along with non oceanic species such as pig, because its the only thing available. Meanwhile we fishermen drive past schools of menhaden in our harbors unable to harvest them. With our current situation we are forced to buy out of state bait that is extremely expensive.

I would like to point out that when menhaden are harvested for bait, they are put back into the ocean and once again absorbed by the sea. Lobsters are not the only creature who benefits from our bait, as it breaks down tiny particles drift out of our traps and are eaten by small fish etc... I believe it is outrageous for Virginia "OMEGA PROTIEEN" to hold OVER 78% OF THE ENTIRE EAST COAST QUOTA. I do not believe reduction fishing does anything to help the ecosystem and its cycle of life, and more quota should be set aside for bait purposes only. How is it allowed in America that one company controls 78% of the entire east coast resource?

3.1. Quota Allocation

3.1.1 - I ask you select Option B, quota's should be based on fish availability and need.

3.1.2- I ask you select Option 4A. I believe a moving average based on the most current years data is the best way to address menhaden availability as well as need. I do not believe using data that's 10 to 12 years old will address the needs of today's fishery. This current year Maine's menhaden fishery, including small scale fishery closed August 28th, that's approximately 2 months before the fish make their seasonal migration out of our waters. Since the closure Maine has once again been importing out of state bait.

3.2 Episodic Set Aside Program

I ask you select Option 2. Increasing the episodic set aside quota will help states like mine that have a great need as well as great resource locally. It will also reduce burden of timely Quota transfers.

3.3 Incidental/ Small Scale Fishery

3.3.1- Timing, I ask you select Option 1 status quo, we rely on the small scale fishery immediately to continue a supply of fresh local menhaden.

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3.3.3- Trip Limits I ask you select Option 1 status quo. Any reduction in trip limits would put more pressure on our already evident bait shortage in Maine. It would also cut menhaden harvesters profit down to a point where it would not be feasible to fish.

3.3.4- I ask you select Option 1 status quo, IC/SSF should not be counted towards state allocation or coastwise TAC, we are talking about such a small percentage of harvest done by small independent fishermen.

[Sent from Yahoo Mail on Android](#)

James Boyle

From: andrew johnson <andyjohnson7488@gmail.com>
Sent: Thursday, September 29, 2022 7:14 PM
To: Comments
Subject: [External] Atlantic MenhadenDraft Addendum 1

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Green Category, Auto Replied

Hello my name is Andy Johnson and I'm from Harpswell Maine. I'm a lobsterman and I use fresh caught menhaden to bait my traps. Maine has been under a bait shortage for many years now, we have been fortunate to have a great menhaden resource right here at our doorstep but unfortunately have been extremely limited on how we can utilize this resource because of our very small quota. It pains me to see Maine fishermen being forced to bait their traps with non native species along with non oceanic species such as pig, because its the only thing available. Meanwhile we fishermen drive past schools of menhaden in our harbors unable to harvest them. With our current situation we are forced to buy out of state bait that is extremely expensive.

I would like to point out that when menhaden are harvested for bait, they are put back into the ocean and once again absorbed by the sea. Lobsters are not the only creature who benefits from our bait, as it breaks down tiny particles drift out of our traps and are eaten by small fish etc... I believe it is outrageous for Virginia " OMEGA PROTIEEN"to hold OVER 78% OF THE ENTIRE EAST COAST QUOTA. I do not believe reduction fishing does anything to help the ecosystem and its cycle of life, and more quota should be set aside for bait purposes only. How is it allowed in America that one company controls 78% of the entire east coast resource?

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3.2 Episodic Set Aside Program

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3.3.3- Trip Limits I ask you select Option 1 status quo. Any reduction in trip limits would put more pressure on our already evident bait shortage in Maine. It would also cut menhaden harvesters profit down to a point where it would not be feasible to fish.

3.3.4- I ask you select Option 1 status quo, IC/SSF should not be counted towards state allocation or coastwise TAC, we are talking about such a small percentage of harvest done by small independent fishermen. I hope you will seriously consider the right thing to do for Maine lobsterman.

Andrew Johnson
License # 7488

Sent from my iPhone

James Boyle

From: Matthew Clemons <matthew.james.clemons@gmail.com>
Sent: Thursday, September 29, 2022 8:14 PM
To: Comments
Subject: [External] Atlantic Menhaden Draft addendum 1

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Auto Replied

----- Forwarded message -----

From: **Matthew Clemons** <matthew.james.clemons@gmail.com>
Date: Thursday, September 29, 2022
Subject: Atlantic Menhaden
To: Matthew Clemons <matthew.james.clemons@gmail.com>

Email to comments@asmfc.org

Subject line: Atlantic Menhaden Draft addendum 1

Hello, my name is Matt Clemons and I'm from Harpswell Maine. I'm a lobsterman as well as a menhaden harvester. I use fresh caught menhaden to bait my own traps as well as sell fresh menhaden to many local fishing wharfs. Maine has been under a bait shortage for many years now; however recently we have been fortunate to have a great menhaden resource right here at our doorstep. Unfortunately, we have been extremely limited on how we can utilize this resource because of our very small quota. It pains me to see Maine fishermen being forced to bait their traps with non native species along with non oceanic species such as pig, because it is the only thing available. Meanwhile, we fishermen drive past schools of menhaden in our harbors and are unable to harvest them. With our current situation we are forced to buy out of state bait that is extremely expensive.

When menhaden are harvested for bait, they are put back into the ocean and once again absorbed by the sea. Lobsters are not the only creature who benefits from our bait, as it breaks down tiny particles and drifts out of our traps and they are eaten by small fish etc... I believe it is absolutely outrageous for Virginia "OMEGA PROTIEN" to hold OVER 78% OF THE ENTIRE EAST COAST QUOTA. I do not believe a reduction in fishing does anything to help the ecosystem and its cycle of life. More quota should be set aside for bait purposes only. How is it allowed in America that one company controls 78% of the entire east coast resource?

3.1. Quota Allocation

3.1.1 -I ask you select Option B, quota's should be based on fish availability and need.

3.1.2- I ask you select Option 4A. I believe a moving average based on the most current years data is the best way to address menhaden availability as well as need. I do not believe using data that is 10 to 12 years old will address the needs of todays fishery. This current year Maines menhaden fishery, including small scale fishery, closed August 28th That's approximately 2 months before the fish make their seasonal migration out of our waters. Since the closure, Maine has once again been importing out of state bait.

3.2 Episodic Set Aside Program

I ask you select Option 2. Increasing the episodic set aside quota will help states like mine that have a great need as well as great resource locally. It will also reduce burden of timely Quota transfers.

3.3 Incidental/ Small Scale Fishery

3.3.1- Timing, I ask you select Option 1 status quo, we rely on the small scale fishery immedietly to continue a supply of fresh local menhaden.

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3.3.3- Trip Limits I ask you select Option 1 status quo. Any reduction in trip limits would put more pressure on our already evident bait shortage in Maine. It would also cut menhaden harvesters profit down to a point where it would not be feasible to fish.

3.3.4- I ask you select Option 1 status quo, IC/SSF should not be counted towards state allocation or coastwise TAC, we are talking about such a small percentage of harvest done by small independent fishermen.

James Boyle

From: David Moody <davemoody46@gmail.com>
Sent: Thursday, September 29, 2022 5:46 PM
To: Comments
Subject: [External] Atlantic Menhaden Draft addendum 1

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Auto Replied

Email to comments@asmfc.org

Subject line: Atlantic Menhaden Draft addendum 1

Hello my name is David Moody. I'm a lobster fisherman from Harpswell Maine. I use fresh caught menhaden to bait my lobster traps. Maine has been under a bait shortage for many years now, we have been fortunate to have a great menhaden resource right here at our doorstep but unfortunately have been extremely limited on how we can utilize this resource because of our very small quota. It pains me to see Maine fishermen being forced to bait their traps with non native species along with non oceanic species such as pig, because its the only thing available. Meanwhile we fishermen drive past schools of menhaden in our harbors unable to harvest them. With our current situation we are forced to buy out of state bait that is extremely expensive.

I would like to point out that when menhaden are harvested for bait, they are put back into the ocean and once again absorbed by the sea. Lobsters are not the only creature who benefits from our bait, as it breaks down tiny particles drift out of our traps and are eaten by small fish etc... I believe it is outrageous for Virginia " OMEGA PROTIEN"to hold OVER 78% OF THE ENTIRE EAST COAST QUOTA. I do not believe reduction fishing does anything to help the ecosystem and its cycle of life, and more quota should be set aside for bait purposes only. How is it allowed in America that one company controls 78% of the entire east coast resource?

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3.2 Episodic Set Aside Program

I ask you select Option 2. Increasing the episodic set aside quota will help states like mine that have a great need as well as great resource locally. It will also reduce burden of timely Quota transfers.

3.3 Incidental/ Small Scale Fishery

3.3.1- Timing, I ask you select Option 1 status quo, we rely on the small scale fishery immedietly to continue a supply of fresh local menhaden.

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3.3.3- Trip Limits I ask you select Option 1 status quo. Any reduction in trip limits would put more pressure on our already evident bait shortage in Maine. It would also cut menhaden harvesters profit down to a point where it would not be feasible to fish.

3.3.4- I ask you select Option 1 status quo, IC/SSF should not be counted towards state allocation or coastwise TAC, we are talking about such a small percentage of harvest done by small independent fishermen.

James Boyle

From: Mike Ferrigno <llbait@yahoo.com>
Sent: Monday, September 26, 2022 7:29 AM
To: Comments
Subject: [External] Menhaden Draft Addendum 1

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Auto Replied

Mike Ferrigno, Owner of L&L Wholesale Bait

I support:

Commercial Allocation
Best for us; option 3•1•2, option 2, using 2018,2019,2021 data

We would also accept;
Option 3•1•1, option B, 3 tier
Or
Option 3•1•2, option 3A (weighted), Sub Option 1

Incidental Catch
3•3•2
Option 2, no purse seines under by catch

3•3•3
Status quo 6,000lb per day

M&M Fisheries Inc. Dba
L&L Wholesale Bait
P.O. Box 556
Islip, NY 11751
(1)-631-224-9675

James Boyle

From: Michele Ferrigno <shellyferr@gmail.com>
Sent: Monday, September 26, 2022 7:30 AM
To: Comments
Subject: [External] Menhaden Draft Addendum 1

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Auto Replied

Michele Ferrigno, President & Owner of L&L Wholesale Bait

I support:

Commercial Allocation
Best for us; option 3•1•2, option 2, using 2018,2019,2021 data

We would also accept;
Option 3•1•1, option B, 3 tier
Or
Option 3•1•2, option 3A (weighted), Sub Option 1

Incidental Catch
3•3•2
Option 2, no purse seines under by catch

3•3•3
Status quo 6,000lb per day

James Boyle

From: Nikolas Fountis <nikofountis@gmail.com>
Sent: Monday, September 19, 2022 4:26 PM
To: Comments
Subject: [External] Menhaden Draft Addendum 1

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Auto Replied

I support:

Commercial Allocation
Best for us; option 3•1•2, option 2, using 2018,2019,2021 data

We would also accept;
Option 3•1•1, option B, 3 tier
Or
Option 3•1•2, option 3A (weighted), Sub Option 1

Incidental Catch
3•3•2
Option 2, no purse seines under by catch

3•3•3
Status quo 6,000lb per day

James Boyle

From: Abbey Ferrigno <abbeyferrigno3@gmail.com>
Sent: Monday, September 19, 2022 4:22 PM
To: Comments
Subject: [External] Menhaden Draft Addendum 1

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Auto Replied

ABBEY FERRIGNO; L&L Wholesale Bait, Bay Shore NY

I support:

Commercial Allocation
Best for us; option 3•1•2, option 2, using 2018,2019,2021 data

We would also accept;
Option 3•1•1, option B, 3 tier
Or
Option 3•1•2, option 3A (weighted), Sub Option 1

Incidental Catch
3•3•2
Option 2, no purse seines under by catch

3•3•3
Status quo 6,000lb per day

From: [Aaron Graves](#)
To: [Comments](#)
Subject: [External]
Date: Thursday, September 29, 2022 5:42:06 PM

Email to comments@asmfc.org

3.1. Quota Allocation

3.1.1 -I ask you select Option B, quota's should be based on fish availability and need.

3.1.2- I ask you select Option 4A. I believe a moving average based on the most current years data is the best way to address menhaden availability as well as need. I do not believe using data that's 10 to 12 years old will address the needs of today's fishery. This current year Maine's menhaden fishery, including small scale fishery closed August 28th, that's approximately 2 months before the fish make their seasonal migration out of our waters. Since the closure Maine has once again been importing out of state bait.

3.2 Episodic Set Aside Program

I ask you select Option 2. Increasing the episodic set aside quota will help states like mine that have a great need as well as great resource locally. It will also reduce burden of timely Quota transfers.

3.3 Incidental/ Small Scale Fishery

3.3.1- Timing, I ask you select Option 1 status quo, we rely on the small scale fishery immediately to continue a supply of fresh local menhaden.

3.3.2- Gear Type, I ask you select Option 1 status quo, small purse seines are an important tool to insure only a specific amount of fish are harvested. I'm shocked there is even a conversation about eliminating purse seines and forcing us to use Gillnets, as gill nets kill everything they catch.

3.3.3- Trip Limits I ask you select Option 1 status quo. Any reduction in trip limits would put more pressure on our already evident bait shortage in Maine. It would also cut menhaden harvesters' profit down to a point where it would not be feasible to fish.

3.3.4- I ask you select Option 1 status quo, IC/SSF should not be counted towards state allocation or coastwise TAC, we are talking about such a small percentage of harvest done by small independent fishermen.

From: [Adam Ulrickson](#)
To: [Comments](#)
Subject: [External] Pogies
Date: Monday, August 29, 2022 8:31:33 PM

The lobster industry is being pressed hard enough from both ends of the spectrum. Pogies are my staple for lobster bait. The cost to date 260.\$ a barrel. If the pogies aren't available the only option we have is frozen bait and that's more expensive than fresh. We need another source of bait to stay alive. If we had 5percent of the quota we wouldn't be having this problem I don't think 5 percent is to much to ask

Sent from my iPhone

From: [Andrew Clemons](#)
To: [Comments](#)
Subject: [External] Atlantic menhaden draft Addednum 1
Date: Friday, September 30, 2022 10:08:42 PM

I am a lobsterman and pogie fisherman from Maine. I believe the quota system is flawed and needs to change, Maine needs a lot more quota to be fair.

I fish in all pogie allocations with a purse seine and rely on the small scale fishery to supply myself and other lobstermen with fresh bait. Purse seining should never be eliminated from the small scale fishery as it is the most efficient way to catch only our daily limit.

From: [Andy Thomas](#)
To: [Comments](#)
Subject: [External] Atlantic Menhaden draft addendum 1
Date: Thursday, September 29, 2022 9:54:05 PM

Hi James Boyle

I am writing about the draft in regards to small scale fisheries. My apologies if this is the wrong place to share my concerns.

I am located in Hull Massachusetts just south of Boston. I am a 4th generation lobsterman. I have small scale permit to catch 6000 pounds with a purse seine. I noticed the draft options include eliminating purse seines or lowering the limit to 4500 or 3000 pounds.

The other nets besides purse seine are not really effective. Gill nets for example are not effective or easy. Waste a lot of time for not many fish.

I don't think it's right to limit the small guys from scraping out a living by catching bait for family and friends. If there is a problem with quotas or fish population, the small scale fishery of Massachusetts is probably the last place I would look to make cuts.

Makes up tiny fraction of fish caught.

Lobstering has become very difficult with fuel costs, bait costs, and so much more.

Can't speak for the other states but I don't think the Massachusetts small scale fishery is having much of an impact on the Menhaden stocks.

Thank you for your time.

Andrew Thomas
Hull Massachusetts

Sent from my iPhone

Sent from my iPhone

From: [Brandon Doucette](#)
To: [Comments](#)
Subject: [External] Atlantic Menhaden Draft Addendum
Date: Thursday, September 29, 2022 6:42:35 PM

Submitting comment on behalf of my father Philip Doucette from Kittery, Maine.

He has been a full-time lobsterman since 1975. He uses a small 60 fathom long by 6 fathom deep purse seine to catch menhaden for lobster bait on his 36 foot boat. All menhaden caught are used by himself or his sons for bait, none are sold. Anything caught over our daily limit is immediately released alive and unharmed, this includes any bycatch inadvertently caught. This cannot be done with some other gear types such as gill nets. We use a brailer net to dip the fish and allows us to count the amount of fish as we take them out of the water. New England, particularly Maine needs more quota, we are seeing more fish migrating from the south every year. The fish we catch are larger, more mature fish than the ones caught down south. This means the fish caught up here account for fewer individual fish taken out of the water. Fewer individual fish caught must be good for the resource.

These are the options we support:

-3.1.1 option B, because this reduces minimum for states not utilizing the resource. Allows for rest to be distributed to states that need them before going to in-season transfers.

-3.1.2 option 4B, because this allows for most current time-frame to set quotas and not a select few years. The fish are clearly migrating more north and the current fishery and landings reflect that. Historical years should not be used to calculate TAC as a number of factors could have caused a state to not participate in the fishery (such as Maine's primary use of herring for lobster bait prior to the herring stock collapse).

-3.2.1 option 2 and sub-option 2, this allows the most flexibility, should reduce quota transfers to states that have had to recently rely on them to keep fishery open.

-3.3.1 option 1, this allows individual states to manage how their TAC is utilized.

-3.3.2 option 1, Maine must be allowed to continue using purse seines. It is the only efficient way we can reliably catch our daily limits.

-3.3.3 option 1, 6000 pounds allows us to catch an entire week's worth of lobster bait in 1 day. This allows us to go lobstering the rest of the week. Option 2 (4500 pounds) would be acceptable but we may have to go 2 days per week. Maine DMR didn't let us fish consecutive days in the small scale fishery (only could go on set days), would have been convenient to select days we wanted to fish. Option 2 or 3 would be difficult to rig up the boat for menhaden multiple times per week, as it takes us about 3 hours just to get boat ready for seining, and another 3 hours to take the seine gear off so we can go back to lobstering.

3.3.4 Oppose both options. Both allow for potential removal of specific gear types in IC/SSF. Removal of purse seine gear in Maine would nearly eliminate this fishery for us. We have tens of thousands of dollars invested in purse seine gear. 2022 was the first year we were able to use it due to Covid-19 supply issues.

Thank you for your consideration,
Brandon Doucette

From: [Charles Bennett](#)
To: [Comments](#)
Subject: [External] Atlantic menhaden draft addendum
Date: Thursday, September 29, 2022 7:31:12 PM

To whom it may concern:

My name is Charles Bennett from Sorrento, Maine. I'm a commercial lobsterman and menhaden fisherman. Please let it be known that I'm in favor of the following parts of the Atlantic menhaden draft addendum:

In regards to 3.1.1 I'm in favor of option B the three tiered fixed minimum approach.

3.1.2 I'm in favor of option 2 using the timeframe of 2018,2019,2021 to base allocating qouta.

3.3.2 I'm in favor of option 1 which would leave the permitted gear types in the incidental fishery the same as it is. Removing purse seines would negatively impact my business as well as the rest of Maines menhaden fishery and lobster industry which so heavily relies on menhaden for bait. It would force fishermen to switch to gill nets which will hurt the resource as it kills everything that enters the net even if it will put the fishermen over his daily qouta thus removing more menhaden then is necessary or allowed.

3.3.3 I'm in favor of option 1 leaving the daily trip limit at 6000 pounds per vessel during the incidental fishery.

Thank you for your consideration,
Charles Bennett

From: [Charles Gebhardt](#)
To: [Comments](#)
Subject: [External]
Date: Friday, September 23, 2022 7:33:13 AM

Hello I'm a commercial fisherman from Maine. I am in favor of keeping the personal use license for bait. I support increasing Maine's commercial menhaden quota. Fisherman should continue to be allowed to use purse seines to harvest menhaden as many have already invested in them. It makes know difference if you harvest x amount with a gill net verses a purse seine.

Sent from my U318AA

From: [Charlie Smith](#)
To: [Comments](#)
Subject: [External] Comment on the piggy fishery from Charles Smith life long lobster fisherman
Date: Thursday, September 22, 2022 11:37:08 AM

I live in Downeast Maine and we just started seeing the mannhadian in my area in last couple years and we're able to catch them this year it was awesome one of the reasons I was able to keep lobstering on the low prices .as a family with kids that fish we all worked together for our bait ended up getting 9nto it enough to sell some . Maine certainly needs more quoter we are the market and the high price of bait is strangling our fisherman amongst other issues .as far as purse saines I can't imagine there's a better way to catch them we dip our limit and let the rest go in hurt very environmentally friendly as for gillnets not so much they kill everything there's no way to manage taking just your limit . Also if you was to lose it or or a piece get ripped up it would keep on killing .as a Maine lobster fisherman I'm asking you guys to give us more Wouter and allow fisherman to keep the purse saines we already have because it's the best way to catch em for us and the resource . Sincerely a 4th generation lobster fisherman and mannhadian fishermen Charles Smith .

[Sent from Yahoo Mail on Android](#)

From: [Chris George](#)
To: [Comments](#)
Subject: [External] proposed changes to menhaden fishery
Date: Monday, August 29, 2022 2:36:38 PM

Hello ASMFC,

Please accept my input on proposed changes to the Atlantic Menhaden fishery.

Do not increase the catch limits. The fishery needs to back down in order to leave menhaden as forage. Reduction fishery is a consolidated business not benefitting the small scale fisher which is top heavy for fishing society, and needs trust busting basically. In fact, in the IC/SSF practices leave the small scale fishery the scraps AFTER the large scale commercial catch quota. This is upside down. Also menhaden oil is not worth having at the cost of the fish. As a lab product there are other fats to experiment on, and the same with protein sources etc. Menhaden is not a sustainable fishery by nature.

As a recreational fisher from Massachusetts I think the rising catch percentages here versus Virginia and the higher states are not a good sign. MA has too too much invested in the environment for recreational purposes to be a catch leader for forage fish. Doesn't make sense: everyone sees the seals and how they are make the shoreside life a little nicer (probably 99% of Mass. residents work on land and aren't affected by seals). Recreationally fishing culture is huge and the bass need the food. Whalewatching is huge and the whales need the forage. etc. I will admit some of my thinking is influenced by the book the Most Important Fish in the Sea. However, as a commercial aquaculturist I can say that an herbivorous fish (where menhaden is the only one I know of) serves the same ecological function of filtering and nitrogen removal touted by proponents of putting more oysters in the water. It only makes sense to ease pressure on this fish stock as it affects N removal, a huge ecological problem tied in with housing issues and septic containment on Cape Cod! Increasing the fishery really is a bad idea.

Sincerely,

Chris George
(508) 310-3021
Yarmouth Port, MA

From: [Cody A Gillis Jr](#)
To: [Comments](#)
Subject: [External] Atlantic Menhaden Draft Addendum I
Date: Wednesday, September 28, 2022 7:27:17 PM

Good evening,

I'm a maine menhaden seiner and am submitting comments for the draft addendum.

I believe it is time for Maine to be awarded more quota. 5% would be a good start, and there should be No talk of removal of directed gear (purse seines) for the small scale fishery. If you allow us to catch 6000lbs a day for small scale, what difference does it make how we get it? With a purse seine we take our allotted daily limit and the rest are set free unharmed. A gillnet has an almost 100% mortality rate and if you catch over the limit those fish are released from the net dead.

I know these comments are probably a waste of time as omega protein and Lunt seafood have probably already been lobbying to retain their blatantly ridiculous amount of quota, but it's my two cents and it's time for a more equitable fishery for ALL ATLANTIC STATES.

Sent from my iPhone

From: [Dale Prentice](#)
To: [Comments](#)
Subject: [External]
Date: Wednesday, September 21, 2022 1:18:32 PM

In reference to the 3 Menhaden issues.

As back in the 80's and early 90's Maine

received permits for joint ventures of 40,000 Mt

@ yr. for 6 years plus some Boats landed around 12 million lbs in both Black's Harbor New Brunswick and Matagan Nova Scotia during those yrs.

I would certainly Hope that ASMFC would approve the maximum of 4.8% of theTAC for the State of Maine as well as the maximum of 5% set Aside for the Episodic Quota.

It seems to me that if this was the case Maine could fish most of the Season on Quota and maybe not even have to resort to the Small Scale Fishery

The Small Scale Fishery should br left at status

quo just as a back up with no large amount of fishing under this option

thanks for your consideration of
these comments

Dale Prentice

From: [dan morris](#)
To: [Comments](#)
Subject: [External] Menhaden Rule Proposed Changes
Date: Tuesday, August 30, 2022 9:07:52 AM

As a Maine lobster fisherman, I have seen some dramatic changes in the availability of bait in the last few years. Our go-to bait for many years has been herring, but that fishery has been cut back so much that we have had to use more menhaden than ever before. Menhaden have historically come to Maine waters for a long time, but were never fully exploited. Now, we are seeing Menhaden in large numbers all along our coast, and the need for them as lobster bait has increased exponentially. With our warming waters, it is certainly possible that we here in Maine, will see even more fish in the coming years. The lobster fishing business in Maine is one of this state's major economic drivers, and without a steady, affordable supply of bait our economy will suffer as will the way of life that generations of small fishing village people have known. It is imperative that ASMFC allocates as much Menhaden quota as possible to Maine to support the lobster fishing industry. Each fisherman is his/her own small business and the long-term health of these businesses depends upon you actions. Thank you for allowing me to comment.

From: b4noon@tidewater.net
To: [Comments](#)
Subject: [External] Atlantic Manhaden Draft Addendum 1
Date: Thursday, September 29, 2022 7:43:33 PM

Greetings,

First, The in person meeting felt positive and beneficial but it was structured wrong. You should record every minute of the meeting. Most of the constructive criticism happens in the first half hour.

Second, Do not outlaw purse seines. They are the best way to capture fish alive and let go unharmed, every time. If you have a bi catch or wrong species at all you simply release them unharmed.

Third, Gill nets kill everything that swims into them. They have a 25% mortality rate of unretrievable fish. And another 10% that is barely alive swimming away extremely damaged. And gill nets are labor intensive.

Fourth, Labor is very hard to come by. We should be able to fish a weekly quota any day we choose.

Fifth, The quota should be split 8% per state.

Thank you for fighting for more quota, Maine Lobstermen need bait.

David Noonan 207-446-8002

From: [David Strout](#)
To: [Comments](#)
Subject: [External]
Date: Wednesday, September 28, 2022 4:59:32 AM

I was at the meeting , The problem is in the leadership of Maine allowing a unfair corrupt management from Virginia who get a unfair amount or quota dictate the fate of Maine fisherman. I being one who will not be eligible to fish in 2023 over it. Because of the corrupt loss of my license I believe Maine can be trusted to take its own fair amount of the quota and endorse leaders who stand up for Maine. Our problem here is in leadership ,due to be replaced,. our journey has just begun. investigate foreign companies who will be the selling point as we recruit allies . I will spend the rest of my life organizing to destroy everything you created as you have destroyed what I have created with years of my blood sweat and tears... I don't recognize you sorry

David Toby O'Connell

4 Blueberry Lane
Rockport, MA 01966
978-836-9760
davidtobyconnell@yahoo.com

Atlantic States Marine Fisheries Commission
Re: Draft Addendum I to Amendment 3 of the
Atlantic Menhaden Interstate Fishery
Management Plan for Public Comment

September 21, 2022

Dear Atlantic States Marine Fisheries Commission-

I appreciate the opportunity to comment on the addendum options. I am writing this letter in response to my attendance to the September 14, 2022, meeting held in Gloucester. I am a single boat owner/operator in Rockport, Massachusetts. I am also a commercial lobsterman. I am a third-generation fisherman and my brother goes fishing as well. I am an active member of the Pigeon Cove Fisherman's Cooperative. I have been lobstering since I was very young and with the rising cost of bait to go lobstering, added an endorsement to my license to go menhaden purse seining. I catch these fish at the current limit of 6,000 pounds per day to use for bait in my 800 traps. I would go seining 2 days a week on my days off from lobstering. This year I didn't catch enough for my bait needs for the season, despite filling my cooler. With a shortened season, it would be even more difficult to offset my bait needs. To give you an idea, menhaden was selling for \$265/barrel this summer. A barrel is about 350 pounds. That comes out to \$0.78 per pound for these fish. They are very expensive to purchase, and I was trying to offset my expenses, as I use the equivalent of \$1,060/day of menhaden in my 400 lobster traps that are hauled each lobstering day.

I was very disappointed to hear that the council is considering the elimination of the 6,000 pounds per day fishery. The comments made by larger bait selling operations were totally erroneous in regard to the small-scale fishery boats. We catch a fraction of the quota in a sustainable, and reportable manner. In my case, it is for personal consumption and not for profit.

In terms of which option presented at the meeting and in the addendum, I have the following thoughts and concerns:

I disagree with Option 2 on page 13 of this report. "2018, 2019 & 2021 The quota allocation timeframe is based on the most recent average landings from 2018, 2019, and 2021. This timeframe reflects the most recent landings history and is more likely to align with current

stock distribution but does not reflect previous stock distribution or fishery performance." This should be considered most heavily based on the market and needs of the fishery. The report omits "historical fishery performance" but this fishery and its purpose have had a strong social and economic shift in the last few years that desperately needs to be prioritized to support the lobster and fishing industry. The crisis for lobster bait has steadily increased over the past few years due to the herring shortages along with the rising cost of importing frozen bait from Canada, Europe and Asia. Without the ability to use menhaden in lobster traps, people are increasingly using animal hide (pig/beef) for bait. To give the council an idea of the presence of it as bait, it's used by approximately 75% of the fishing lobster boats this season to try and offset bait expenses and its ease of availability. The economic impact of taking the 6,000 pounds per day limit away will further exacerbate the lobster bait shortage/crisis.

From the report, page 22/23, Section 3.3.1 Timing of the IC/SSF Provision, I support Option 1. No change/Status Quo. It is critical the 6,000 lb daily catch allowance be maintained to support small scale fisheries, day boats, etc. who play an important role in supporting additional small businesses such as bait for lobstering and those like myself who are trying to catch my own bait. A proposed 3,000 lb limit would make it impossible against fuel/crew expenses to make the day trips worthwhile. It would make it financially impossible to leave the dock. It would have a substantial impact on the bait supply, as this is often a locally driven demand/market as a secondary fishery. It will put unnecessary economic hardship on small businesses like mine.

Page 23 of the report, Section 3.3.2 Option 1 removal of specific gear types- I support that no removal of gear types is implemented. Without the small-scale seining boats like myself participating in the menhaden fishery, this will create a higher bait price for the lobster fisherman left in the market. This type of harvesting is a small portion of the allowable quota and done in a manageable, reportable, and responsible manner. The economic impact to the fishing industry with the small-scale seining boats taken out would be catastrophic. The bait expense could not be able to be covered and there would an inability to go lobstering for my business without lobster bait.

I also disagree with the use of gillnets. I would never suggest this as there is a 100% mortality rate with the use of gillnets. The best part of small purse seines is that all the fish released are alive and well and there is no negative bycatch associated with this equipment type.

Page 24; 3.3.3 Trip Limit for Directed Small- Scale Fisheries of IC/SSF Provision. I support Option 1, no change to the trip limit. As I explained earlier in my comments, 6,000 pounds is a small amount for the amount of menhaden used by my single lobster boat/operation. I use the equivalent of four barrels per day (allowable 17 barrels per day of catch for perspective on how many barrels are used out of 6,000 pounds per day) and I go lobstering four days per week. That comes out to 16 barrels per week. With only going menhaden seining one-two days per week, I catch the amount I use roughly in one week and trying to fill my cooler for September

and October. It's not a large amount that is wasted or in excess. Without the ability to catch my own lobster bait, the economic impact on my business and those like mine would be crippling.

Thank-you for the opportunity to comment from an owner/operator purse seining menhaden boat. Thank-you for your time and consideration.

Warm Regards,

David Toby O'Connell

From: [Denise Hylton](#)
To: [Comments](#)
Subject: [External] Atlantic. Menhadin draft addendum 1
Date: Thursday, September 29, 2022 2:26:31 PM

Hello,

i am a Maine resident and we have a summer camp in Milbridge. Twenty years ago there were pogie schools in Narraguagus bay. One or two small boats netted them for lobster bait. This year we counted five large trawler type boats in Narraguagus bay netting pogies. On a sunday in August a minke whale came through the bay after pogies. I am for limiting the pogie catch. We have fished out the cod and herring. Now the pogies are in danger of being fished out too. Why? to feed the lobster industry. It takes years of feeding our native fish to a lobster for it to make one meal. We need a sustainable future fishing program. Let's start now. i vote to stop or limit the taking of native fish for bait.

Thank you,

Denise Hylton

P.o. box 206

Washington Maine

04574

From: [Doug.Laura.McLennan](#)
To: [Comments](#)
Subject: [External] Atlantic Menhaden Draft Addendum I
Date: Sunday, September 25, 2022 5:44:38 AM

I am writing this letter in support of our small boat fishery in Maine targeting Atlantic Menhaden. This fishery has been growing for the last few years and has become a very important part of coastal communities. Not only has it provided much needed income in this tough economy, but it also provided a new bait source for the lobster industry. The bait resource is local and fresh, and doesn't require expensive trucking cost, keeping the price lower for fishermen. As with any fishery, management is a vital part of ensuring we are able to continue to harvest. It seems that fisheries management has turned into over regulation, managing the fisherman out of business. We as fishermen here in Maine have very few fisheries left that haven't been regulated down so much that we are left with no means to make a profit. We as fishermen need enough quota to make it profitable to fish for whatever species we are allowed by the government. In Maine we have a very difficult situation with Pogies. We have three events in which we can harvest. Our entire market is the lobster industry. We need to be able to supply them with a steady supply of bait thru out the season, and coincide with when the fish are in our state waters. The current 3 quota system we have now doesn't do that. The episodic event gives us quota in June, when the lobsters are shedding, and trap activity is low. This quota works for bait companies that have the resources to store bait, but rises the cost of bait, because salt and storage by refrigeration are required. If we could rework the quota to a single system where we have the summer months to harvest, it would ensure that we have access in the late summer, early fall months. My second concern is that we may be banned from using purse seines. All of the coast that is under management for ASMFC uses mainly seines for harvest. The small seines we use are the cleanest form of harvest. We have other species of fish that are abundant, but protected by law to not harvest. The seine allows for those fish to be released without harm. We are the equal also on a daily catch limit. Using a seine allows for the extra fish caught to be released alive. The idea of using gill nets should never be considered. Gill nets are the absolute worst method of fishing. The gill net kills all that is caught, and also catches unwanted species. If your intent on regulation is conservation, gill nets should be removed from this idea is coming from other states that want Maine to not harvest. We have a council that gives the southern states power over us smaller northern states.

This year our state tried to suppress the amount of effort in our emerging fishery. I wonder if this wasn't done on purpose to mess up the opportunity of a new fishery. The State of Maine has prior history of making a total disaster of limiting effort. No attention was needed in effort, but when people are threatened with removal of access, they are going to meet the requirements for a license. The state went from around 300 participants, to around 900 by requiring a 25,000 pound history. This was the last open resource that a person could purchase a license for. By requiring a 25,000 pound requirement to keep your license, the state forced a huge influx of pressure on the activity level. The state has done this in every other fishery they have mismanaged. It causes a rush to maintain the right to access a means of income. They have removed the meaning of being a fisherman, to rely on only the lobster. We used to be able to jump to other fisheries, but no more. Management was not meant to eliminate access, but to ensure economic prosperity. We have lost this vision of fishery management. The rules that emerge become so complicated that it is hard for the average man to comprehend the terminology, and the intent. I believe next season will see less activity because of the fulfillment of requirement of the state regulation.

It would be nice if the method to manage fisheries would include input from the harvester. Times are tough enough now to survive in this business. The people making the laws have no idea what it takes to keep a business in any fishing industry viable. How can someone invest in their future when at any time the fishery could be closed, or worse, have so many regulations added that you just can't make ends meet? We have invested a considerable amount of money in the gear required to catch pogies. This is an investment for a small business that may seem small to a large corporation, but is huge to a small family. I have seen this time and time again. It's like a test to see how much one can endure.

The menhaden resource has been moving north for the last couple years. The southern states do not like us catching our own fish I understand. We should have the same access as the southern states. We use small nets, and have small boats. We also have regulations that limit the threat of over harvest. Maine catches a small amount of resource compared to Virginia. Our roughly 12 million pounds hardly compares to 300 million pounds. Many families are dependent on quota, and access to fish in Maine. This resource has taken some pressure off the lobster fishery. It has provided bait, and also removed some effort from lobster fishing.

In closing, I would like that an open mind is considered when choosing the path for our future. Our state is on the verge of a coastal collapse if the lobster industry is shut down with federal regulations pertaining to the Northern Right

Whale. Our state is abundant with fish, but no access is available. If the federal government was willing to release some permits for ground fish we would ensure a future for our families. I would like to see a small boat permitting process develop to utilize emerging resources. The small boats aren't what put us where we are with management, but our fisheries were pressured with the decisions in the federal regulations with ground fish, herring, and scallops. The government was influenced by corporations with lobbyist, and the family owned and operated vessels have all but disappeared. The lobster fishery is what bailed out the displaced fishermen. We need access to ensure our future. The resources are there. Thank You for your time. Doug McLennan ,Spruce Head , Maine

September 30, 2022

Duncan Haass

Maine Lobsterman

Commercial Menhaden License Number #27314

(207) 479 - 6377

To The Atlantic States Marine Fisheries Commission,

My name is Duncan Haass and I am a second-generation lobsterman. I am passionate about the lobstering industry and fully support the other aquaculture that takes place in Maine waters. With the recent cutbacks on the herring quota and the increase in price for any frozen bait, Atlantic Menhaden, often referred to as Pogies in our local fishing community, have been a blessing to Maine fisheries and aquaculture. I support an increase of Maine state Atlantic Menhaden quota, as well as continuing the use of purse seines in the small scale fishery.

Our Maine lobster industry is one of a kind. We indirectly provide nourishment for juvenile lobsters, put measures in place to protect female lobsters, and have legal size requirements - all proof that lobstermen acknowledge the importance of sustainable harvest. To support and maintain this sustainable harvest of lobster, fishermen need bait. Experience has proven that the fresher the bait, the more likely a fisherman is to have a good catch. A good catch results in more income, which goes back into the local Maine economy, by supporting deckhands and the various other local companies that commercial fishermen rely on to keep their businesses running. I employ two deckhands year-round who depend on me to provide for them and in turn, support their own families. Having a commercial Menhaden license has allowed me to expand my business and explore other aquaculture opportunities that Maine waters have to provide.

The Maine Menhaden industry is sustainable because it is a gentle fishery and it is honoring the life cycle of the fish. Through my experience, I have seen that using a gillnet to catch fish harms the fish more than using a purse seine. Purse seining allows for a quicker, more efficient harvest. This style of fishing helps commercial fishermen adhere to a catch and release policy that does not harm the fish that exceed their quota and are released back into the ocean.

September 30, 2022

The state of Maine uses about nine percent of the Total Allowable Catch (TAC) for bait. We catch about 4.5 percent ourselves through state allocation and small scale fisheries. The rest of the bait that we use has to be transported into the state. This results in more trucks on the road as well as congesting the roads with extra traffic. I recognize and appreciate the regulations that have been put in place by the Atlantic States Marine Fisheries Commission. However, I believe that we should increase the Menhaden quota so we can continue to support our local community while also working to reduce the carbon footprint associated with commercial fishing.

According to the NOAA Fisheries website, “Menhaden support an important commercial fishery. They constitute the largest landings, by volume, along the Atlantic Coast of the United States. Menhaden are harvested for use as fertilizers, animal feed, and bait for fisheries including blue crab and lobster.” I support an increase of quota and continuing the use of purse seines because it supports the local Maine economy, it allows commercial fishermen to continue practicing sustainable harvest methods, and it reduces the carbon footprint that is tied to commercial fisheries.

Thank you for your time and consideration,
Duncan Haass

Works Cited:

Fisheries, NOAA. “Atlantic Menhaden.” *NOAA*, 30 Sept. 2022,
<https://www.fisheries.noaa.gov/species/atlantic-menhaden>.

From: [Emily Haslett](#)
To: [Comments](#)
Subject: [External] Atlantic Menhaden Draft Addendum I
Date: Thursday, September 29, 2022 11:12:55 AM

To the Atlantic Marine Fisheries Commission,

I am writing to you as a seasonal resident of Milbridge, Maine, and as an oyster farmer. I would like the Commission to impose stricter catch limits on Menhaden in the Gulf of Maine. I have watched the increase in fishing boats catching Menhaden and the subsequent decline of coastal birdlife and marine mammal life with the decreased presence of Menhaden.

I have spent significant time in Narraguagus Bay in downeast Maine. Over the past twenty years, I have witnessed the disappearance of starfish (sea stars), mussel beds, soft shell clams, sea urchins and sea cucumbers to name a few. Osprey used to visit the cove often at low tide, catching fish easily and flying off. The cove was alive with flounder and other small fish. Osprey now come, hover for extensive periods of time and leave with nothing. Lobster boats that used to be followed by huge flocks of noisy seagulls, now have no birds following them at all. I know you too have witnessed the demise of the coastal ecosystem due to increasing temperatures, acidification and overfishing.

As you know, the decline of sea life feels dire on so many levels and there is no doubt that human activity has played a huge role. In the past three to four years, there has been a shocking and delightful turn as the Menhaden or "pogies" have arrived in increasing numbers. Bird life has increased, and we have witnessed wild evolution before our eyes. Seagulls are catching Menhaden too large to consume. They peck at them until a heron comes to steal it, or a crow comes to help out. Osprey now graze the bubbling Menhaden filled waters and catch a fish in a novel way, hovering rather than diving. It has been painful to watch a heron desperately attempt to catch one with its long legs dangling just above the water. Seals abound in ways we've never seen before. And amazingly this August, in Narraguagus Bay, a Minke whale was seen devouring "pogies." It was a beautiful sight.

That said, I was extremely concerned when Menhaden commercial fishing boats, five at a time, spent all day Monday, Wednesday and Friday, prowling the waters with their nets in August. Their catch was enormous, and life in the Bay diminished significantly. No longer were there playful seals or flocks of cormorants catching fish. It was painful to watch, especially remembering how overfished the cod and herring have been.

My concern led me to reach out to our DMR wardens who assured me that Maine's Department of Marine Resources is working on this, which is why I am writing to you today. I want to voice my vote for increasing restrictions on Menhaden catch in the Gulf of Maine. While I respect the need to support livelihoods for bait fisher families, I also want to cast a vote for the ecosystem-- for foraging fin fish, coastal birds and marine mammals. I do believe our oysters are regenerating the surrounding waters and attracting Menhaden. It is then awful to watch the sizable schools be captured in one net haul.

We have a chance to do this right, to strike a balance to an ecosystem that is dying on so many levels. The Menhaden are a gift to the foraging fin fish, coastal birds, and marine mammals. May we please find a way to share so that we don't fish them out completely once again, preventing any regeneration of ocean life, so critical on so many levels?

I am happy to give testimony if that would be helpful.

With thanks for your consideration and wise decision making. We don't have many chances left.

Gratefully,
Emily Haslett
Milbridge, Maine
(781) 308-3888

From: [Foster Bartovics](#)
To: [Comments](#)
Subject: [External] Atlantic Menhaden Draft Addendum 1
Date: Thursday, September 29, 2022 10:00:28 PM

My name is Foster Bartovics, I am a commercial menhaden harvester from North Haven, Maine. I use my catch primarily for bait in the lobster fishery.

under state allocation:

I support step one option B and step 2 option 4B

under EESA:

I support the status quo

under the IC/SSF provision:

I strongly support the status quo option for permitted gear types. The majority of small vessels engaged in commercial menhaden fishing in Penobscot bay are rigged as purse seiners. Purse seining is the most effective and sustainable method for catching menhaden on a small commercial scale. Not only is this method efficient and practical for catching fish, but it also allows us to safely release any fish over the daily limit. Although I would rather have a status quo for trip limits under IC/SSF, I would strongly support a decrease in daily limits over removing the purse seine from the allowable gear types.

Thank You

40 foot F/V Jamma Jac, Inc.
Fishing port Frenchman's Bay, Maine
September 28, 2022

Dear ASMFC,

This letter is in support of:

3.1.1 Option B Allocation.

3.1.2 Option 2. Allowing Maine to increase its quota.

The F/V Jamma Jac has purse seined for the past 3 years. There is such an abundance of large menhaden here. The menhaden are larger here than the menhaden in southern New England. Due to the size of the fish, we harvest less fish in comparison to southern New England States.

F/V Jamma Jac goes scalloping and purse seining. Fishing for menhaden makes up 65 percent of the boat's income. The lobster fisherman heavily rely on affordable, fresh, locally caught menhaden. Affordable bait is a key commodity for Maine's lobster industry. The herring quota has been cut, so the F/V Jamma Jac depends on purse seining menhaden.

This fishing vessel supports 3.2.1 option 2.

It is important to the fishing vessel Jamma Jac to fish with a purse seine. Purse seines are a proven sustainable fishing gear that allow fishermen to catch and release fish and other marine species unharmed. Using a purse seine is less wear and tear on the crew and on the boat.

We ask for support on 3.3.2 option 1. Status quo.

Thank you,

F/V Jamma Jac, Inc.

Sorrento, Maine

From: [Galen Plummer](#)
To: [Comments](#)
Subject: [External] atlantic menhaden addendum1
Date: Wednesday, September 21, 2022 5:15:33 AM

this is an important issue for 2 fisheries, the menhaden fishery but also the lobster fishery as it helps in keeping operation costs down for many fishermen. understandably with 12 million pounds caught under the small scale fishery in 21 would cause alarm but i feel if the state quota and the eposodic fishery in Maine would make it so we rely less on the small scale fishery. i also feel that keeping the status quo as far as gear requirements is a must. gill netters will never keep up with the demand and are indiscriminate.

thank you
Galen Plummer, fisherman out of Corea Harbor

From: [Henry Whetham](#)
To: [Comments](#)
Subject: [External] Menhaden comment
Date: Wednesday, September 28, 2022 12:31:45 PM

To whom it may concern,

I was lucky enough to get involved in the menhaden fishery 5 years ago soon after they returned to Casco Bay in Maine. The first year w/ a gill net and I've since moved on to a purse seine. There is no question a purse seine is a more efficient and clean way to fish. You can set the net around a school of fish, take what's needed and release anything additional unharmed. The idea of eliminating the purse seine from the small scale fishery seems ridiculous to me as it is the cleanest fishery I've ever seen and I am very strongly opposed to any move to restrict the use of a seine.

My other concern relates to the resource itself. As a lobsterman I see bait that comes from up and down the eastern seaboard and the pogies that are delivered to us from Virginia through New Jersey are often far too small! It seems obvious to me that if you're fishing on the young, immature schools that don't have the opportunity to reproduce, it's just a matter of time before the stock is negatively affected.

When lobstering we bait a trap with 3 or 4 of our local pogies but it takes between 10 and 14 fish to get the same mass from the pogies that are trucked up here from VA & NJ. I truly don't understand how so much concern can be made of quotas and the TAC without paying any attention to the size of the fish that are being caught. Between VA and NJ I believe they have 89% of the quota. The state of Maine currently has .52%. So if they have 180 times the quota we have and their avg fish weighs 1/3 of what ours does, that means they're catching 540 fish to our 1. Those 540 fish never had the opportunity to reproduce while our local fish have several times. This is not responsible resource management and I fear unless steps are taken to change this practice of fishing on zeros, our future is bleak.

Thank you for your consideration.

Henry Whetham
Chebeague Island, Maine

From: [hugh.bowen](#)
To: [Comments](#)
Subject: [External] Public hearing-Atlantic menhaden addendum
Date: Wednesday, August 31, 2022 7:05:40 PM

My public comment – the state and federal governments are destroying our fisheries by over regulation, we are in and have been in a stranglehold. Fisherman need the ability to catch what they can when they can. We are about two generations away from being out of your hair. To get to the point, to even think about banning seining fishing for menhaden during the ME state small-scale fishery and only allowing Gillnets, is about as silly as me taking a hammer and intentionally hitting my thumb. Thank you for my precious time, Hugh Bowen.

Sent from my iPhone

Atlantic Menhaden Draft Addendum 1

To Whom This Concerns:

I am commenting on Draft Addendum 1. As a commercial fisherman Captain for 47 years I have both lobstered and Pogie fished for most of my life. The major issue I see is that the quota system is greatly flawed. The allocation time frame of 2009-2011 were the years the fish had migrated north in very small quantities and because of this, Maine had a low record catch at that time. I believe a change is necessary. It doesn't seem fair to eliminate landing made in 2020. Yes, Covid was a factor, but it was global and affected everyone in the Menhaden fishery. Maine and New Jersey had more fish landed, due to more fish migration and should not be penalized in the percentage of landings, 2020 should be included, this is totally unfair.

Based on allocation tables provided:

3.1 Quota Allocation

3.1.1 Option B should be chosen, quotas need to be based on the availability and need of the fish.

3.1.2 Select Option 4A. Setting this with current data is essential.

3.2 Episodic Set Aside Program

Option 2, increasing the episodic set aside quota should keep quotas up to date.

3.3 Incidental/Small Scale Fishery

3.3.1 Timing Option 1 Status Quo

3.3.2 Gear Type Option 1 status Quo only. Any vote for Option 2 will directly target Maine and not allow fish to be caught when the fish are needed in quantities. This will directly upset the lobster industry and further drive up the cost of lobster bait. Purse Seines are the most user-friendly, cost effective, safest and fish friendly method of catching menhaden. Catch and keep quota and release live extras.

3.3.3. Trip Limits Sub Option 1 Status Quo- This allows a cost effective product to be sold. Any other option will not be as cost effective, i.e. wasted time and money.

3.3.4 Option 1 Status Quo

Please contact me if you have any questions.

James Clemons
Harpwell, ME 04079
207-504-7896
popclemons@icloud.com

Atlantic States Marine Fisheries Commission DRAFT ADDENDUM I TO AMENDMENT 3 OF THE ATLANTIC MENHADEN INTERSTATE FISHERY MANAGEMENT PLAN FOR PUBLIC COMMENT

Move to initiate an addendum to consider changes to commercial allocation, the episodic events set aside, and the small-scale/incidental catch provision. The purpose of this action is to address the issues outlined in the Atlantic Menhaden work group memo and the PDT should use the strategies provided in the work group memo as a starting point

Definition of *episodic*

1 : made up of separate especially loosely connected episodes

2 : having the form of an episode

3 : of or limited in duration or significance to a particular episode : temporary may be able to establish whether the sea-floor spreading is continuous or episodic

The Addendum proposes options to adjust states' commercial allocation to better align with availability; adjust the percentage of the episodic event set aside (EESA) program; and reduce incidental catch and small-scale fisheries (IC/SSF) landings from recent levels.

2.1 Statement of the Problem

Since the implementation of Amendment 3 (2017), dynamics in the commercial menhaden fishery have changed, most notably the rise of landings in the Gulf of Maine and an increase in quota transfers to the New England region; an increase in landings under the IC/SSF provision; and an annual reliance by some states on the EESA program. To sufficiently

address the issues posed by these changes, the addendum addresses three separate but related components of the management program: 1) commercial allocation, 2) the IC/SSF provision, and 3) EESA program

Clearly Atlantic States Marine Fisheries Commission HAS A MANAGEMENT PROBLEM NOT A RESOURCE OF MENHADEN.

Atlantic States Marine Fisheries Commission has not discussed resource enhancement!

Three species exist from Florida to Maine, Science indicates hybrids create large population increase yet Atlantic States Marine Fisheries Commission DOES NOT discuss ocean ranching, stock enhancement.

Atlantic States Marine Fisheries Commission HAS NOT ASKED A MAJOR AQUACULTURE COMPANY IF AQUACULTURE / ENHANCE / OCEAN RANCHING COULD BE ACCOMPLISHED **NO DISCUSSION OR INVESTIGATION!**

Atlantic States Marine Fisheries Commission is a paper organization with no research to United States Fish and Wildlife. WHERE IS SCIENCE ON MENHADEN? Papers state Menhaden go to sea off Hatteras yet no research exist as to where and when the fish return.

SPAWNING THEN RELEASING MENHADEN EGGS BY THE TRILLIONS SHOULD / COULD INCREASE POPULATION!

DRAFT ADDENDUM 1 TO AMENDMENT 3 DOES NOT ADDRESS CAUSES FOR MENHADEN POPULATION INCREASES OR DECREASES! ***EPISODIC EVENT WHY?***

Begin in Florida St John River {menhaden reduction plant closed.

Beaufort NC Menhaden reduction plant closed. **CAMP LEJEUNE WATER QUALITY ISSUE?**

WHERE IS EPA, NC DEPARTMENT OF ENVIROMENT why man made chemicals affecting reproduction. Does Addendum 1 address chemicals? NO !

Atlantic States Marine Fisheries Commission science has NOT INVESTIGATED THE POPULATION OF MENHADEN COAST WIDE.

NO DISCUSSION FOR WATER QUALITY RESULTING IN POPULATION FLUCTUATION .

EPISODIC EVENT! WHY

Atlantic States Marine Fisheries Commission should cancel Atlantic States

Marine Fisheries Commission

DRAFT ADDENDUM I TO AMENDMENT 3 OF THE

ATLANTIC MENHADEN INTERSTATE FISHERY

MANAGEMENT PLAN FOR PUBLIC COMMENT

THIS IS ALLOCATION NOT FISHERY MANAGEMENT; **WHERE IS ANY SCIENCE?**

James Fletcher
123 Apple RD
Manns Harbor NC 27953
9/30/2022

My name is James West. I am the owner/operator of the 42' F/V First Impression II. I fish out of Sorrento, Maine. A small port in Frenchman's Bay.

I support 3.1.1 Option B

I support 3.1.2 Option 2 and/or Option 4-4A

I support 3.2.1 Option 2 Sub Option 2

I support 3.3.2 Option 1

I **DO NOT** SUPPORT 3.3.2 OPTION 3

I lobster, scallop, purse seine menhaden and herring. Menhaden fishing makes up 55% of the boats' income. I employ three other men seining. I supply fresh Menhaden to myself and to, lobster buyers that supply bait to their fishermen. I also supply fresh bait to at least 45-50 local fisherman. It would be absolutely devastating to my crew along with our community to lose this way of fishing.

According to the paperwork I have seen, Maine at most could get 4.82 % of the quota. This is a small percentage. I realize historical landings play a role, but times are changing. Menhaden is abundant affordable fresh bait that Maine fisherman need. We have fish from June through October.

Our Department of Maine Resources along with commercial fisherman here want to protect Maine waters and marine species. The best way to harvest Menhaden and protect all of our other species is by using a purse seine. I use an 80 fathom X 8 fathom purse seine. I know the law allows up to 150 fathoms x 8 fathoms. I'm sure fishermen would compromise to use a smaller purse seine rather than not be able to use a purse seine.

Fishing with a purse seine allows us to catch and release. This allows many marine species to survive and thrive in our waters.

Maine lobster fishermen cannot understand how one state/company are allowed most of the quota. The one company is now owned by a Canadian company. While one state thrives, Maine is begging for a little piece of the pie.

Thank you and please ASMFC help us.

James West

Sorrento, Maine

From: [Jason Colby](#)
To: [Comments](#)
Subject: [External] Menhaden comments
Date: Wednesday, September 21, 2022 8:30:43 PM

Hello, My name is Jason Colby, I am a lobsterman, scallop dragger, and I also fish for Menhaden. I am commenting on a recent meeting I attended. There are 3 things that were mentioned during this meeting.

1. Raising Maine's Episodic quota from 1% to 5%, which I am in favor of.
2. Small-scale gear: I am in favor of the Status Quo because I believe that it best fits Maine small-scale fishery, I personally use a purse seine and I think it is the best way to go because in the small-scale I can get my daily quota and release the remaining fish alive. At the same time I don't have any issue with anyone that wants to use other methods to catch their quota.
3. Incidental catch and small scale daily quota. This quota is currently set at 6000 pounds 3 days per week. I am in favor of the Status quo on this as well, our stocks have been getting better each year and I don't think there is a need to cut the daily limit.

Thank you for your time and for allowing comments.

Sent from my iPhone

From: swansislandcharters@gmail.com
To: [Comments](#)
Subject: [External] Support for various options of Menhaden draft addendum 1
Date: Thursday, September 22, 2022 2:02:26 PM

Good afternoon ASMFC boardmembers,

I am writing to express support for 3.1.2 option 4 and sub-option 4b which would allow Maine with a growing menhaden distribution to increase its quota. Any quota increase allocated to Maine would result in less total fish caught than other states. I am basing this on the size of fish harvested here vs. those in southern New England states. Maine's menhaden are larger which would result in less fish harvested to achieve the same poundage caught elsewhere... I am amazed at how small some of the menhaden are that are available from southern states as bait. I am a lobsterman and my industry relies heavily on the ability to harvest/purchase locally caught menhaden.

I also support 3.2.1 option 2 which increases Maine's quota. We need a minimum of 20 million pounds, but 40 million pounds would be much more fair considering the size of our fish and the abundance.

Lastly I am asking for your support for the most sustainable gear type (purse seine)...3.3.2 option 1.

It amazes me that any fair minded government body would consider gillnets over a proven sustainable fishing gear type like the purse seine. The ability to release fish unharmed should be the number one priority of any regulatory body as opposed to gillnetting which will result in more dead fish, more waste, and more plastic pollution.

Thank you for your consideration,

Capt. Jason Joyce
Maine Lobsterman
Swan's Island Selectman
207-479-6490

HARBOR BAIT, INC

69 Atlantic Avenue
Boothbay Harbor Fish Pier
Boothbay Harbor, ME 04538

P.O. Box 385
Boothbay, ME 05437
(207) 633-2214
harborbait@outlook.com

September 29, 2022

Atlantic States Marine Fisheries Commission
James Boyle, FMP Coordinator

Re: Draft Addendum I to Amendment 3 of the Atlantic Menhaden Interstate Fishery Management Plan

Our family owns and operates a lobster bait company in Boothbay Harbor, Maine, as well as a federally-permitted herring seiner. We purchase menhaden (pogies) directly over the dock from local fishermen and also from New Jersey, Rhode Island, and Massachusetts. As you are well aware and as is stated in the "Draft Addendum", the herring quota was drastically reduced, and this has led to a reliance mainly on menhaden to help fill the bait gap. Consequently, our business is directly affected by any changes made to the menhaden fishery.

It seems that there is a lot of focus on removing certain gear types from the IC/SSF fishery, namely purse seines. There would be no need to limit gear types and catch amounts if the quota is distributed properly. Don't eliminate purse seine just because it is a clean and efficient, and sometimes the only way to catch menhaden.

Maine fishermen have had to rely on the small scale fishery (along with the EESA) because the quota is just too small. Why should the Maine fishery be penalized because they don't have anywhere near an adequate quota to provide for its bait needs? Landings show that Maine needs a *minimum* allocation of 20 million pounds (each of the last four years landings totaled well over 20 million). With a bigger piece of the pie, Maine would not have to rely on the IC/SSF and thus the current permitted gear types would not be an issue. Also, I would suggest that anchored/stake gillnets and drift gill nets are being used as directed gears.

Although menhaden was plentiful in Maine waters all summer and into the fall, the fishery was closed and remains closed. We and other bait dealers have had to purchase pogies from NJ. This allows other states to artificially manipulate the price of bait in Maine. As the Draft Addendum states, "the TAC is not being fully used coastwise, while some states do not have enough quota to maintain current fisheries". This statement precisely describes the dilemma the Maine fishery finds itself in. The same two states – VA and NJ have controlled the majority of the TAC for many years and they are not the only states that have huge investments in the fishery. It is time to even the playing field.

I support the following:

1. All states should catch **their total quota** (not a single sector such as VA and NJ) before implementing IC/SSF. Until the allocation among the states have been revised, it is not prudent to the change either the trip limit or the gear type in the IC/SSF. The IC/SSF **should** count toward the TAC.
2. The three-tier minimum allocation, Step 1, Option B and the three year moving average allocation (Step 2, Option 4A). There must be more flexibility to manage the rise and fall of landings among the states.
3. Overage Paybacks – If compliance reports can be completed on or before January 15, then Option 1. Status quo. I am not sure why they are not due until August 1. Most catch is reported daily. If the compliance date of August 1 must remain, then Option 2
4. EESA – Option 2, Sub-option 2. This gives the Board the most flexibility even accounting for the tiered minimum approach.

Sincerely,
Jeanne Fuller

From: [Jeb Worcester](#)
To: [Comments](#)
Subject: [External] Menhaden addendum
Date: Thursday, September 22, 2022 4:41:54 PM

My name is jeb Worcester, I have a menhaden license in maine. I'm having trouble getting a copy of the addendum. But a friend of mine went to one of the meetings and gave me a summary. I strongly oppose the idea of getting rid of purse seine. And I think maine should get a little more quota. It definitely seems as though more fish are up here then in years past. So it seems to make sense that the quota should move with the fish. And another reason for alot more fish being landed this year is partly due to a massive increase in boats fishing for them. The lobster price was low this year so alot of lobsterman went after pogies instead of hauling traps. The year before was different because the lobster price was very high. So those boats tended their traps instead of going after pogies. If the lobster price is better next year I'm guessing there won't be as much effort from lobsterman to catch pogies. Getting rid of purse seine is a horrible idea. The result is going to be dead pogies everywhere which nobody wants. Nobody wants to deal with Gil nets so no one will go. And with more pogies seemingly coming every year, they will smother themselves and die. I like the first quota at 68 barrels per week, then, like this year, just have the small scale fishery after that. I would like to see an option for possibly having a weekly quota of 51 instead of 3 days of 17. But I understand that might be challenging for trying to keep everyone honest. So the small scale fishery works. Thank you for reading my comments.
Jeb worcester.

Also, I work for a lobster buying company on matinicus island maine. The pogies we have been buying that are being caught to the south are very small. I think that's another reason why we should get more quota. We catch bigger ones that have gone through their life span. Catching all those small ones I think can't be good for the stock as a whole cause they probably can still spawn a few more times.

James Boyle
Senior Fishery Management Plan Coordinator
Atlantic States Marine Fisheries Commission
1050 North Highland St., Suite 200 A-N
Arlington, VA 22201

RE: Atlantic Menhaden Draft Addendum I

Dear Mr. Boyle:

My name is Jennifer Orchard and I am writing to you today in hopes that I may help facilitate your decision-making efforts regarding the current assessment of the North Atlantic Menhaden fish species.

For the past five years I have been a resident on the islands of Deer Isle, and also Stonington, Maine. Additionally my husband has lived on this island for close to 20 years. We both have commercial licenses for shellfish harvesting here in this state. I have received several years of college undergraduate education in multiple areas of discipline that include: paralegal studies, law enforcement, forensic science, and cyber security. I am also a mother of four, and also a grandmother. From the age of childhood, I have been openly passionate and most captivated by the creatures found in nature. I'm especially fond of aquatic life and various fish species that inhabit the oceanic environment.

On the afternoon of August 9th, 2022, my husband and I were heading to launch our new boat skiff at *Grey's Cove*; also known as Reach Beach, which is in Deer Isle, Maine which is also maintained by the Island Heritage Trust Association. Immediately, after arriving that afternoon with the provision of high tide, we observed the horrendous smell of dead fish. After exiting our vehicle off the soft shoulder of the pavement, we quickly realized the source was coming from six blue 100-pound lobster crates sitting on the high end towards the-left side of the beach, that were approximately 10-15 feet in distance from the general access point to the shore adjacent to the public thoroughway known as Reach Road, in Deer Isle.

The following morning on August 10th, as my husband and I were returning to the same beach location, I received a text message from a summer resident homeowner living nearby to the beach who informed me she had discovered "several plastic crates of dead fish dumped out on the beach that were stinking horribly all along the shore."

Approximately an hour later this same individual who contacted me that morning regarding the smell, stated she just witnessed "a guy in a black truck, dumping the dead fish out of the crates onto the beach." She later indicated in another message to me that her husband had taken pictures of the dead fish on the beach and that she would like to notify the town but, was afraid of "stirring a hornets nest."

Incidentally, her husband, Lou did not share her apprehension about reporting the dead fish findings to the town officials and when we arrived at the beach, he (Lou) was there waiting. Lou was visibly upset about these findings and his assertion was that he had

personally contacted James Fisher, the current manager for the town of Deer Isle. Moments later, Mr. Fisher arrived at the beach, asking my husband if he knew the person(s) responsible for the leaving dead fish to rot. We directed his attention to the guy who owns the black truck, because he's also the owner of a small boat anchored at Reach Beach that had nets and other equipment aboard commonly used for pogie fishing.

Despite the eye witness accounts, well documented photographs, and receiving backlash from neighboring residents of the beach, Mr. Fisher decided that without "further proof" there was nothing he could do.

Initially, when we had discovered the lobster crates containing dead fish strewn upon the shoreline, we were unaware of them being chocked-full with bunker "pogie" fish until the next following day when we arrived and witnessed the actual fish scattered about on the beach. I currently have in my possession, a dozen or more photos (courtesy of Lou) that were forwarded to me before returning home to his winter residence. I have attached a few of the images for reference. These graphic images illustrate devastation brought to the Menhaden fish population, by a single incident here in the North Atlantic. These fish lost their lives maliciously- without just cause or concern to differentiate the species age, weight, gender, size or full scope of the habitat/ oceanic landscape impacted due to these kinds of ecological devastations. Given the fact the "plastic crates", were in fact lobster totes that can individually retain 100 pounds each we could assume the damages exceed over 1000 pounds of fish, which further hinders this species ability to generously repopulate in the future.

Without further supporting evidence from the town officials here that might suggest that appropriate measures have been taken to prevent these kinds of incidents from ever occurring again in the future, The town manager has lost tremendous rapport amongst the neighborhood island residents closest to the beach who held a reasonable expectation that Mr. Fisher would have taken a pro-active approach.

Based on the town officials response, 'I'm left to wonder if the entire event went completely undocumented to the state DMR, Marine Patrol, NOAA and other forms of administrative stake holding authorities. I urge you to take a closer inspection of the latest recorded landings for Menhaden fish here in Maine whereas I am every bit as confident to suggest that the numbers are not even close to accurate, due to mishandling like this incident, poachings and poorly represented landings data.

In 2018, when I first moved to this area before my husband and I were wed, we spent countless days during the summer on the ocean for fun of an afternoon joyride. One thing I remember most about that time, and for a few summers afterwards, was hearing and see the phenomena of pogie fish, jumping out of the water each day. In June of last year we lost our home and made an enormous transition in our lives to live aboard our 30-foot Chris Craft Catalina. For this specific reason, we are keenly observant our surroundings and the many things that commonly occur here on the open ocean.

Living on a boat is a front row seat in the stadium to a real time exhibit that most people will never see inside of their lifetime, let alone could ever imagine. This year was the first season since I became a resident here on this island that the Menhaden fish have been

unequivocally silent—not so much as a single splash. The summer of 2022, has become the summer without pogies.

The Department of Marine Resources, and the area marine patrol officers need every available support that may be granted to their disposal, to help save the North Atlantic pogie fish from further species degradation.

Respectfully,

Jennifer E. Orchard

Ajsanibel2015@gmail.com

Tel: 207-659-4228



From: [JEREMY THOMPSON](#)
To: [Comments](#)
Subject: [External] Atlantic Menhaden Draft Addendum I
Date: Thursday, September 29, 2022 9:20:49 PM

We in maine need a 6000lbs a day purse seine fishery to maintain our lobster fleet I would like to see an increase in our quota to reflect the numbers we have landed in 2019-2022

Jeremy Thompson
Stonington

From: [Doyle, Jim](#)
To: [Comments](#)
Subject: [External] Atlantic ocean menhaden
Date: Monday, August 8, 2022 9:50:08 AM

Individually, the most important gamefish food on the entire Atlantic seaboard, Menhaden should be protected at all cost with the highest restrictive harvest.

You can't have food without Bees!

You can't have life without Oxygen and Water!

You can't have billions of revenue supporting 1000's of businesses per state without Gamefish. Let's name a few: Gasoline and everything sold at the station, tackle and equipment from local shop and marina to on-line to big box stores, accommodations like hotel, motel, VBRO, Cars. Boat and motors, food, drink, and everything else that goes along with a fishing outing from Airfare to rental cars. I've spent money on all of them every year for the past 25.

You can't have Gamefish without Menhaden. It really is that simple.

I spend \$1000's every year on the pursuit of Gamefish. You only have to do the math to calculate the ROI by state to allow this resource of baitfish to thrive.

US technology to harvest and \$ demand because of that harvest has outpaced Menhaden reproduction over the past 75 years (a 10 year moratorium is not out of the question – and with this part of the discussion I believe the discussions around resource responsibility would have a much better flavor) and restriction to use the resource responsibly has floundered (no pun intended). Lake Powell and Mead for examples of blind failure to resource responsibly. Herring has had a resource moratorium recently and is slowly rebounding out of vital necessity.

The current condition of this resource is already in a state that we have been remiss in allowing. Let's learn from our mistakes and do the right thing for our sports, our communities, and the eastern seaboard.

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352-377-1140
An Equal Opportunity Employer

From: [Joe Gieger](#)
To: [Comments](#)
Subject: [External] Menhaden
Date: Sunday, September 18, 2022 1:16:13 PM

Please please continue to protect this so very important fish. As a resident of NJ I can't begin to tell you how much an impact this tiny fish has on all Whales are back , osprey's are risings and the health of the ecosystems are benefitting.

Please count me in for support

Joe gieger

Harvey cedars Nj

6462860750

Sent from my iPhone

From: [John Tripp](#)
To: [Comments](#)
Subject: [External] Atlantic Menhaden Draft Addendum I
Date: Wednesday, September 28, 2022 10:33:09 PM

Hello, My name is John Tripp I am a Maine based commercial fisherman, who has recently invested into the healthily growing menhaden fishery in our area. This fishery has come as a blessing in a time when high price imported bait and increases in fuel prices have been a huge hit to profitability in the Maine lobster fishery. I support conservation measures for an equitable fishery for states that are able to participate in the fishery. I hope that these regulations aren't an attempt to cut out Maine or Massachusetts fishermen from harvesting this resource. The following review of what has been presented is only based on the hope that the ASMFC recognizes and supports equitable fisheries amongst all states in a way that supports healthy conservation measures. The Maine fishermen are harvesting a fully grown fish that has had the ability to grow and reproduce a number of times before it has been harvested. We as a majority owner operators look to keep harvesting a sustainable resource. We don't want kill every fish that comes our way, we want to harvest menhaden in a way that doesn't over stress fish the stock, we want the resource to reproduce and continue to maintain its status as a healthy resource. We use the bait fresh, 25% of my daily landings were utilized by myself as fresh bait from the Atlantic Ocean to bait lobster pots as opposed to bait imported from the Pacific Ocean.

3.1.1 option A gives everyone 0.5% in which I believe they can forfeit into the EESA if they don't intend to utilize. Option B is 3% less deducted from the TAC, but gives states with active fisheries a 0.5% start. Assuming option B divides the 3% back into the TAC and gives more to be reallocated into the EESA if it's able to go for 1%-5%. I would support option B if it does on face reallocate the landings back into the EESA otherwise I support option A.

3.1.2 I support option 4 it reflects how the fish are actually distributed as time and provides a tool for states allocation to grow as fishery distribution shifts. I support sub option 4b as it gives states with growing menhaden distribution the ability to increase their quotas as the stock distribution shifts.

3.2.1 Option 2 on EESA to go to up to 5% also aids states ability to participate in stock distribution shifts, if the EESA is increased to 5% a state with less quota but more fish has the ability to harvest EESA fish and potentially increase the future quota under 3.1.2 option 4b, I would support this.

3.3.1 I support option 3 as it reserves the IC/SSF quota for a state that has exhausted its quotas for menhaden in all its fisheries instead of just a sector or gear type.

3.3.2 Strongly support option 1. Purse seines offer fishermen the ability to be conservation minded in allowing bycatch to be released, regulated and controlled. Eliminating purse seines is essentially an attempt to wipe out almost 100% of fisheries in the IC/SSF quota.

3.3.4 Option 1. While I do agree the IC/SSF should be accountable for its catch against the TAC it is clear that this amendment is being altered to do so and also limit and or regulate us out of the IC/SSF. The moving parts and sub options in option 2 hinder my support for accountability in the IC/SSF.

Thanks, John Tripp

From: [Julie Miller](#)
To: [Comments](#)
Subject: [External] Atlantic Menhaden Draft Addendum 1
Date: Saturday, September 17, 2022 6:56:23 PM

Dear Mr. Boyle,

My name is Ira Miller, I am a fisherman from Tenants Harbor, Maine. I have taken part in Maine's commercial menhaden fishery for a number of years now, it has become a very important fishery for me as I supply myself and other fishermen at my Co-op with fresh menhaden for use as lobster bait. This fishery has become an integral part for not only every fisherman at our Co-op, but also for almost every lobster fisherman within the State of Maine. This is especially true given the collapse of the Atlantic herring fishery which greatly reduced the supply of bait for our industry. So while there is a possible financial gain for those who catch the fish, the real gain for our State is that fact that it supports many other businesses which in turn create thousands of other jobs in our State that depend on the lobster fishermen being able to fish, which of course depends on a steady supply of bait. Another benefit of being able to conduct this fishery in and around our Maine coastline is the fact that from an environmental standpoint the footprint created to harvest that bait locally is much less as the trucking and freezing capacity to get the bait from elsewhere out of state is greatly diminished which is a win in a world where a carbon footprint is always a concern. The fact cold storage is reduced as some amount of this bait is used fresh so it actually will not even require the energy to freeze or cool it a more responsible use of our resources. Another upshot is that the fresh bait will generally fish better than the stored bait which helps fishermen to retain more of their income for the same amount of effort. I have another couple of major concerns that I would like to comment on before I address the document. The first one would be the fact that any thoughts of not allowing the use of purse seines in any of the three segments (State Quota, EESA, IC/SSF) of this fishery be dismissed! From my years of experience I believe purse seining to be one of the cleanest gear types that currently participate in this fishery given the fact that you can easily regulate your catch allowing any overage of trapped fish to be released unharmed. Not to mention the fact that with the restrictions regarding the length and depth of our nets and also the makeup of our rocky coast leave a lot of habitat for the fish to shelter in where they are inaccessible to harvest. Next I would like to suggest that any States that regularly do not land their allocation but won't release their allocation to others on a somewhat consistent basis should only be able to do that for just so long (maybe 2-3 years) before they are at least forced to release their quota into the EESA program for distribution if required as the allocation they have received is meant for harvest. My last comment before I address the document would be that the fishermen in Maine are catching the older larger fish which have had the chance to spawn numerous times, in contrast to the menhaden that are being trucked in from the mid Atlantic at times. It seems to me that any good fisheries management practice should be taking in to account the stocks size and age distribution and how and where the harvests that take place are affecting that distribution. The fish I've seen trucked in at times are at least 3-4 times smaller than what we are harvesting in our State. Wouldn't it be a win for everyone if those juvenile fish were allowed to grow and reproduce multiple times before leaving the fisheries? I challenge this board to look into this aspect of the fishery and find a way to take that into account when managing this fishery!

On to the Draft Document, the following list is my response to all of the proposed actions contained in this document.

3.1.1 Allocation for addressing the minimum allocation,

I prefer Option A. Status Quo as I believe every State deserves an equal starting basis.

3.1.2 Timeframes to base allocating the remaining TAC,

I prefer Option 2. 2018, 2019 & 2021 I believe this is the way allocation should be split up as it responds to the most recent distribution of the stock. It is also stated in this document that there is more than one hundred years of evidence that there have been periods of abundance of menhaden in the Gulf of Maine that may last from one to twenty years and then disappear again for one to twenty years. I believe that this evidence supports the fact that Option 2 is the proper way to handle allocating the menhaden fisheries.

Option 4. Moving Average

I think I prefer option 4A. No Alterations to the Option.

Overage Paybacks.

I like Option 2. Second year after overage. It sounds as this option would be potentially less disruptive to the fishery while allowing an accurate payback of overages.

I'm a little confused by the document at this point, but I think Table 7 A4A. Represents the scenario's I have chosen

above if I'm correct.

3.2.1 Increase the Set-Aside

I favor Option 2. Increase up to 5%

3.3.1 Timing of IC/SSF provision

I choose Option 1 No Change (Status quo)

3.3.2 Permitted Gear Types of the IC/SSF Provision

I support Option 1. No changes to permitted gear types (Status quo)

3.3.3 Trip Limit for Directed Small-Scale Fisheries of IC/SSF Provision

I choose Option 1. No change to trip limit (Status quo)

3.3.4 Catch Accounting of IC/SSF Provision

I choose Option 1. IC/SSF landings do not count against a state allocation nor the annual TAC

I thank you for your time to review and take into account my feelings regarding this document.

Sincerely,

Ira M. Miller

F/V Mallary Sky

From: [Justin Boyce](#)
To: [Comments](#)
Subject: [External] Atlantic manhaden draft addendum 1
Date: Wednesday, September 28, 2022 9:16:30 AM

I am a maine fishermen who wants to comment on the future of our manhaden fishery. Hopefully the state of Maine can receive more quota for the future and continue to use our purse seines and supply our lobster industry with locally sourced bait. Maine is being hit with many challenges with whale restrictions to the lobsters bait shortage and major price inflation as well as diesel prices being at all time highs. The one positive thing we had working for us was an abundance of manhaden but with out quota we were not able to catch a sufficient amount to supply our industry with bait and have had to rely on frozen out if state bait that cost about 30 to 40 percent more per pound and much of it is also juvenile product which I can't see as good for the industry or us. Please just allow us to at least 6000k pounds per day 2 days a week and use purse seines to catch them. Thank you

From: [Kevin Glover](#)
To: [Comments](#)
Subject: [External] Atlantic Menhaden Draft Addendum I
Date: Friday, September 30, 2022 7:50:03 PM

My name is Kevin Glover. I am lobstermen out of Owl's Head Maine. I have also been fishing for Menhaden for the past 4 years as well. I started fishing for Menhaden so I could cut back on the cost of bait that I use for lobstering. As many of you know, the cost of bait for lobstermen has been on the rise for the past years, and is still going up. The Menhaden fishery in Maine is very important to Maine's lobster fishery because it not only provides fresh bait but also a little bit cheaper bait. If we can catch the bait in Maine and save on trucking costs it helps us save in many ways. I really feel that without Menhaden the past few years Maine's lobster fishery would have suffered. I really hope that we can make sure Maine and other New England states have a fair shot at the Menhaden Quota. We have seen a rise in the amount of fish in the New England states and It would be nice if we would be able to have a quota to go with it. I feel that Maines quota should be more than what it is. I feel that the landings over the past 4 years in New England have proved that the Menhaden stock is moving north, which shows that we could support a larger quota. I really hope that a lot of thought is put into this and all states are well represented. I would like to see the most recent years be used in the stock assessment. I also feel that Purse Seines should be allowed. I have no idea why a gill net would be a better way of catching fish than a seine. A couple of reasons would be you can release fish out of a purse seine unharmed, also a purse seine does not need any lines to the ocean floor. With all the upcoming regulations in the lobster and fixed net fisheries why would you want to put more ropes in the water. That would not make any sense.

Thank you,
Kevin Glover

From: [Kevin Grindle](#)
To: [Comments](#)
Subject: [External] Atlantic Menhaden Draft Addendum
Date: Friday, September 30, 2022 7:12:34 PM

To Whom it May Concern,

Kevin Grindle from Little Deer Isle, Maine here. I have been harvesting pogies for the past 4 years and it is my only source of income in the summer months. The influx of pogies has been a good resource for the area. It is tough to watch them on a daily basis and not be allowed to fish them. Even tougher to purchase a boat and equipment only to be shut down shortly into the season and be left with no means to pay for the venture. I have read and tried to understand your system for quota allotment but it seems a bit convoluted to me. This fishery appears to have been mismanaged on many levels and in need of stabilization. With that being said i very much would like to see an increase in quota for the state of Maine and or whatever adjustments that need to be made so that this resource can be harvested and utilized in an orderly fashion. I would also like to see that a seine continue to be an accepted method for harvesting. I would also ask that the regulations be made well in advance of the season so that we can plan and purchase our equipment accordingly. Thank You.

Kevin Grindle
Little Deer Isle, Maine

From: [Kristofer Koerber](#)
To: [Comments](#)
Subject: [External] Atlantic Menhaden Draft addendum 1
Date: Friday, September 30, 2022 4:40:19 AM

My name is Kris Koerber and I'm a lobsterman out of Harpswell, Maine. I use fresh caught local menhaden to bait my traps. Maine has been pressed with a bait shortage for many years now but we have been fortunate to have a great menhaden resource right here at our doorstep. Unfortunately have been extremely limited on how we can utilize this resource because of our very small quota. It is frustrating that lobstermen use non native species along with non oceanic species such as pig because it is the better, financially available, option. Under our current situation, because we are not able to harvest our local menhaden, we are forced to buy out of state bait that is extremely expensive.

When menhaden is harvested for bait, they are put back into the ocean and once again absorbed by the local environment. Lobsters are not the only creature who benefits from the bait; as it breaks down, tiny particles drift out of our traps and are eaten by small fish etc... "OMEGA PROTIEN" to hold OVER 78% OF THE ENTIRE EAST COAST QUOTA is an outrage. I do not believe reduction fishing does anything to help the ecosystem and its cycle of life, and more quota should be set aside for bait purposes only.

3.1. Quota Allocation

3.1.1 -I ask you select Option B, quota's should be based on fish availability and need.

3.1.2- I ask you select Option 4A. I believe a moving average based on the most current years data is the best way to address menhaden availability as well as need. I do not believe using data that's 10 to 12 years old will address the needs of today's fishery. This current year Maine's menhaden fishery, including small scale fishing.

Thank you

Kris Koerber
Zone F representative

From: [Lucinda Nieuwkerk](#)
To: [Comments](#)
Subject: [External] Atlantic Menhaden Draft Addendum I
Date: Friday, September 30, 2022 10:10:45 PM

I lobster and fish for a living. I am an owner/operator.
I catch menhaden. The majority of what I catch I use as bait in my lobster traps .

3.1.1 minimum allocation

I think Option B is a better choice than Option A.

Maine has had more quota transfers than any other State from 2013 to 2021.

This shows that there is big enough biomass of Menhaden in Maine, and enough fishermen willing to rig their boats to catch them. Our tiny allocation was not enough to allow us to keep fishing for menhaden for more than a handful of days, so we needed the quota transfers to extend our season.

From 2016 to 2021 Maine ranked 3rd, coast wide, for the highest percentage of the catch of Menhaden, even though our Amendment 3 allocation was .5%, while Virginia had 78% of the allocation and New Jersey had 10.87% of the allocation.

Considering that Maine is the Northeastern most state, that is quite a feat. Every other state got their chance to catch the menhaden before they came to us.

3.1.2 Time Frame used for allocation

I support changing the time frame to Option 2, using 2018, 2019, and 2021,

I don't think just because people harvested fish in 2009-2011 that they should continue to 'own' that amount of fish infinitely into the future. I think Menhaden is a public resource and all fishermen in all states should have an equal chance to catch them.

I also think that if states further south get to harvest a huge allocation then it disrupts the supply chain for the northern states. It is reasonable to assume that Maine sees a very tiny fraction of the Menhaden biomass because of Virginia's 78% allocation and New Jersey's 10.87% of the allocation.

3.2.1 Episodic Event Set-Aside

I support Option 2: to increase the coast wide TAC of fish up to 5% .

I support sub option 1, the EESA is set as a static amount of 1-5%

If it weren't the EESA our menhaden season would last 2 weeks because we reach our coast wide allocation that quickly.

3.3.1 Timing of IC/SSF

I support option 3 because the State of Maine has such a small coastwide allocation that it is caught within 2-5 fishing days.

3.3.2 Permitted Gear types of the IC/SSF

I support Option 1 Status Quo no changes in the gear type.

I believe the purse seine is the best way to catch Menhaden. It allows me to only take the amount of fish that I am allowed to keep that day, and I can let all the other menhaden go, and they all live.

Gillnets kill all the fish that caught in it. There is no way to control the amount fish that happens to swim into a gillnet. If I am only allowed 6,000 lbs of menhaden a day, and 10,000 lbs of menhaden swim into my gillnet, I would have killed 4,000 lbs of menhaden that I couldn't keep.

3.3.3 Trip limits

I support option 1 status quo

I think 6,000 pounds is a decent amount of Menhaden to catch in 1 day. It allows me to catch Menhaden a few days a week, and I can lobster a few days a week and use up the bait.

Reinier Nieuwkerk
Kennebunk Maine

From: [Gina Bennett](#)
To: [Comments](#)
Subject: [External] Menhaden Management
Date: Friday, September 30, 2022 8:43:18 AM

I am a commercial fisherman from Sorrento, a small town in Downeast Maine. This has been a very difficult year for the lobster fishery. Low prices due to reduced demand and very high operating costs. The only bright spot has been the abundance of menhaden in our area and the ability to catch them for lobster bait. I support option 1 to base allocating the remaining TAC. This would give Maine more quota and reduce the need for relying on getting quota from other states. I support option 1 no change to permitted gear types. Seines are the most efficient type of gear. If you catch more than your allowable amount we can release the fish alive. Gill nets kill all the fish and are much more labor intensive. I also support leaving the trip limits the same. I use a small 40 fathom seine to catch my own bait for lobster fishing and it has been very important to keeping my business profitable and what we catch does not amount to anything when compared to the total quota.

Thank you,
Mark Bennett
Sorrento, Maine

Draft Addendum 1, 1
Public comment of Atlantic Menhaden fishery

9-29-22

Mark Cheney, Lobster fisherman from John's River
Pemaquid, Maine. I fish for Pogie and depend
Greatly on the Pogie fishery for my source of
Lobster Bait for my self + 2 other lobstermen that sell their
Lobsters at my wharf. I use a 7fath. x 45 fath. purse sein
we can catch and store away in a cooler our bait supply
for 4-5 months of the season.

- 3.1.1 option 3: 3 tiered fixed approach I support.
- 3.1.2 option 4: moving average I support.
- 3.2.1 option 2: increase landings up to 5% I support.
- 3.3.1 option 1: no change to quota allocation I support.
- 3.3.2 option 1: no change to permitted gear types I support.
- 3.3.2 option 2: I do not support in any way. I believe
gillnets are a big bycatch problem, tons of stripe Bass out here where
we fish. Using my purse sein I only caught 1 stripe Bass this
summer and released alive.
- 3.3.3 option 1: no change to trip limit @ 6000 lbs. I support
because less than 6000 lbs. make it hard to stock up on bait, The pogies are most
plentiful in June + July my boat can hold 6000 lbs. every trip counts.
- 3.3.4 option 1: status quo. I support

From: [Mark Jr. Moody](#)
To: [Comments](#)
Subject: [External] Atlantic Menhaden Draft Addendum 1
Date: Friday, September 30, 2022 9:12:02 AM

Hello ASMFC,

Menhaden are a main bait source that we rely on here in Maine for our lobster fishery. We are hoping for more quota as we have history in the past but not much from when the quotas were re assessed in recent years.

We are strongly in favor to keep the use of purse seines in the Incidental catch and small scale fishery. Option # 2 would work the best for our working coast here in Maine.

Thank you, Mark Moody Jr
[Sent from Yahoo Mail for iPhone](#)

From: [Matthew Clemons](#)
To: [Comments](#)
Subject: [External] Draft addendum 1
Date: Thursday, September 29, 2022 8:15:30 PM

Atlantic Menhaden

M



Matthew Clemons

to me

1 hour ago

Details

Email to comments@asmfc.org

Subject line: Atlantic Menhaden Draft addendum 1

Hello, my name is Matt Clemons and I'm from Harpswell Maine. I'm a lobsterman as well as a menhaden harvester. I use fresh caught menhaden to bait my own traps as well as sell fresh menhaden to many local fishing wharfs. Maine has been under a bait shortage for many years now; however recently we have been fortunate to have a great menhaden resource right here at our doorstep. Unfortunately, we have been extremely limited on how we can utilize this resource because of our very small quota. It pains me to see Maine fishermen being forced to bait their traps with non native species along with non oceanic species such as pig, because it is the only thing available. Meanwhile, we fishermen drive past schools of menhaden in our harbors and are unable to harvest them. With our current situation we are forced to buy out of state bait that is extremely expensive.

When menhaden are harvested for bait, they are put back into the ocean and once again absorbed by the sea. Lobsters are not the only creature who benefits from our bait, as it breaks down tiny particles and drifts out of our traps and they are eaten by small fish etc... I believe it is absolutely outrageous for Virginia "OMEGA PROTIE" to hold OVER 78% OF THE ENTIRE EAST COAST QUOTA. I do not believe a reduction in fishing does anything to help the ecosystem and its cycle of life. More quota should be set aside for bait purposes only. How is it allowed in America that one company controls 78% of the entire east coast resource?

3.1. Quota Allocation

3.1.1 - I ask you select Option B, quota's should be based on fish availability and need.

3.1.2- I ask you select Option 4A. I believe a moving average based on the most current years data is the best way to address menhaden availability as well as need. I do not believe using data that is 10 to 12 years old will address the needs of today's fishery. This current year Maine's menhaden fishery, including small scale fishery, closed August 28th That's approximately 2 months before the fish make their seasonal migration out of our waters. Since the closure, Maine has once again been importing out of state bait.

3.2 Episodic Set Aside Program

I ask you select Option 2. Increasing the episodic set aside quota will help states like mine that have a great need as well as great resource locally. It will also reduce burden of timely Quota transfers.

3.3 Incidental/ Small Scale Fishery

3.3.1- Timing, I ask you select Option 1 status quo, we rely on the small scale fishery immediately to continue a supply of fresh local menhaden.

3.3.2- Gear Type, I ask you select Option 1 status quo, small purse seines are an important tool to insure only a specific amount of fish are harvested. I'm shocked

there is even a conversation about eliminating purse seines and forcing us to use gill nets, as gill nets kill everything they catch.

3.3.3- Trip Limits I ask you select Option 1 status quo. Any reduction in trip limits would put more pressure on our already evident bait shortage in Maine. It would also cut menhaden harvesters profit down to a point where it would not be feasible to fish.

3.3.4- I ask you select Option 1 status quo, IC/SSF should not be counted towards state allocation or coastwise TAC, we are talking about such a small percentage of harvest done by small independent fishermen.

From: [Michael Dawson](#)
To: [Comments](#)
Subject: [External] Atlantic menhaden draft addendum 1
Date: Friday, September 30, 2022 7:23:16 AM

Hello I am Michael Dawson from NEW Harbor Maine I fished for menhaden in the 80s and early 90s on large scale operations here along the whole Maine coast. I currently fish for menhaden as bait on my 42 boat using a small purse seine and the small scale fishery is crucial to my business to supply bait for my coop and for myself as I lobster also. If we lose the ability to use a purse seine later in the season when fresh menhaden is crucial to lobster industry it will be another huge blow to my business, which is currently fighting to survive with these new whale rules coming at us. I hope you consider this when you take up the small scale fishery in the new addendum, these boats working in this fishery are small lobster boats trying to catch their own bait and for the other fisherman who fish for co-ops and docks. Lots of them are just hand hauled seines made up of a couple fisherman teamed up to catch 17 barrels to use themselves. This is very important to this industry. Thank you Michael Dawson
F-V Lisabeth Ann New Harbor Maine

From: [Michael Polisson](#)
To: [Comments](#)
Cc: nichola.meserve@mass.gov
Subject: [External] pogies quota comments
Date: Friday, September 30, 2022 4:11:07 PM

It appears that the state of maine is running amuck issueing permits for the unregulated 6000# per day fishery.....at the hearing is was stated that they had issued over 900 permits for this category of the fishery of which over 300 were active this year.

The figures presented show they were allowed to WAY OVERFISH their allotted quota by a huge amount overall through this loophole.....this type of unregulated fishing has to STOP before it affects all states fishing for pogies..

I have heard from friends in maine that a lot of the permit holders are selling a large amount of pogies over the rail and still landing the 17 drums to the dock.....this tells me that no one really knows what maine has landed for pogies this year.

I realize why this is happening with the skyrocketing price of bait and scarcity of it..... This needs to be addressed quickly before it seriously affects the biomass of pogies and the fishery itself.

Michael Polisson, Commercial Fisheries Consultants
18 G Millbrook Park
Rockport, MA 01966
978-479-0972

From: [Nicholas Heal](#)
To: [Comments](#)
Subject: [External] Menhaden
Date: Friday, September 30, 2022 4:48:32 PM

Good afternoon

As a commercial fishermen for menhaden I don't understand why the possibility of removing purse seines from the small scale fisherie is even a option! The purpose of us as stewards of the sea is to protect the animals we harvest. Using a purse seine we are able to only take what we need, then release the rest alive. There is very little to no bi catch with a purse seine. A gill net does not and will not discriminate on what it catches. If we were to catch over the limit we would be forced to discarded it dead. That seems like a waste of a resource if you ask me.

Thank you

From: [Nicole Parkes](#)
To: [Comments](#)
Subject: [External] (subject line: Atlantic Menhaden Draft Addendum I)
Date: Wednesday, September 28, 2022 1:09:38 PM

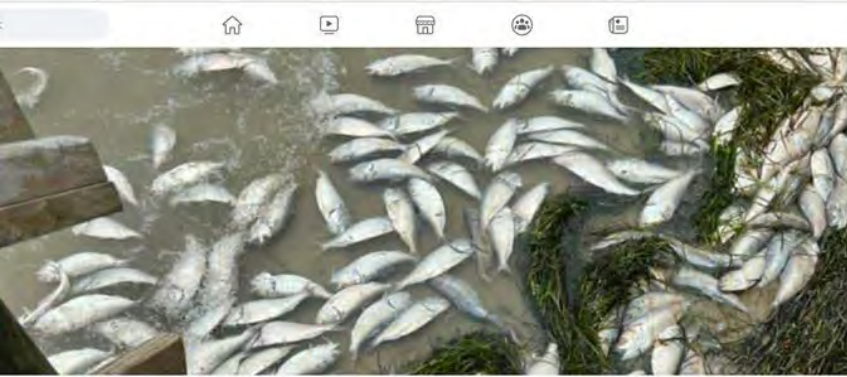
Hello

Many thanks for keeping me up to date with the followings.

kind regards

nicole parkes
(Overseas subscriber)

From: [Phil Zalesak](#)
To: [Carolyn N Belcher](#); [Cheri Patterson](#); [Chris Batsavage](#); [Conor McManus](#); [Sen. Craig A. Miner](#); [Craig D Pugh](#); [Dan Mckiernan](#); [Del. Dana Stein](#); [Sen. David H. Watters](#); [Sen. Dave Miramant](#); [David Sikorski](#); [DAVID BORDEN](#); [Dennis Abbott](#); [Doug Haymans](#); [Emerson Hasbrouck](#); [Eric Reid](#); [Erika Burgess](#); [GARY JENNINGS](#); [Bryan Plumlee](#); [James Boyle](#); [CAPT. JAMIE GREEN](#); [Rep. JAY MCCREIGHT](#); [Jerry Mannen Jr.](#); [JESSICA MCCAWLEY](#); [James Gilmore](#); [Joe Cimino](#); [JOHN CLARK](#); [John Maniscalco](#); [Josh Newhard](#); [Justin Davis](#); [KATHY RAWLS](#); [KRISTOPHER M KUHN](#); [LOREN W. LUSTIG](#); [LYNN FEGLEY](#); [MALCOLM RHODES](#); [MARTIN GARY](#); [MAX APPELMAN](#); [Megan Ware](#); [Meghan Lapp](#); [Mel Bell](#); [Rep. Melissa Zlobron](#); [NICHOLA MESERVE](#); [Patrick Keilher](#); [Patrick Geer](#); [Peter J. Clarke](#); [Raymond Kane](#); [Renee Zobel](#); [RITCHIE WHITE](#); [Maj. Robert Kersey](#); [ROBERT LAFRANCE](#); [Senator Ronnie W. Cromer](#); [Roy Miller](#); [Russell Dize](#); [Sarah Ferrara](#); [Rep. Sarah K. Peake](#); [Spud Woodward](#); [Stephen Train](#); [Sen. Susan Sosnowski](#); [Monty Mason](#); [Thad Altman](#); [TIM SCHAEFFER](#); [TOM FOTE](#); [Rep. TREY RHODES](#); [WARREN ELLIOTT](#); [WILLIAM HYATT](#); [Rep. William J Carson](#)
Cc: [PHILIP ZALESAK](#)
Subject: [External] MONITOR THE DAILY DESTRUCTION OF THE CHESAPEAKE BAY ATLANTIC MENHADEN FISHERY BY OMEGA PROTEIN
Date: Monday, September 19, 2022 7:08:47 AM



Menhaden - Little Fish, Big Deal!

Private group · 598 members



Joined + Invite

Atlantic Menhaden Management Board Members,

First, you can now monitor the daily destruction of the Chesapeake Bay Atlantic menhaden fishery by Omega Protein, a Canadian owned company. This site also documents Omega Protein's destruction of bycatch like red drum.

Go to Facebook site: Menhaden - Little Fish, Big Deal!

Here's a typical post to this site: <https://www.facebook.com/groups/765772041406313>

Second, please review and implement your goals and objectives as stated on page ii of: http://www.asmfc.org/uploads/file//5a4c02e1AtlanticMenhadenAmendment3_Nov2017.pdf

Finally, shut down Omega Protein's industrial reduction fishery in Virginia waters. Limit their harvest to outside the 3 nautical mile Exclusive Economic Zone for the benefit of US fishermen and the marine environment.

Take care and be safe,

Phil Zalesak

President

Southern Maryland Recreational Fishing Organization

www.smrfo.org

<https://www.facebook.com/groups/598428253621775/>

From: [Philip Powell](#)
To: [Comments](#)
Subject: [External] Atlantic Menhaden Draft Addendum I
Date: Friday, September 30, 2022 8:13:37 PM

I am writing to comment on the Atlantic Menhaden Draft Addendum, specifically section 3.3.3. I believe that the directed small scale fisheries limits should stay as they currently are at 6000 pounds. We've already had a de facto cutback on our 6000 pound limit through the mandatory container requirements, and any more reductions in the limit would begin to make this fishery no longer financially viable. The socioeconomic impact of altering the small scale fishery would have a guaranteed negative result on both us as well as our direct beneficiaries. The fish caught under the small scale fisheries go directly towards serving the owner/operator(s) that caught them, as well as local fisherman utilizing the bait resource. Cutting us back a few thousand may not seem like much to those who catch much more every day, but for our small harbors and operations it makes a big difference. It can be the difference between seeing my fellow peers tying up because they can't get bait for the day, or going out and preserving our constantly combatted way of life. At a time of increased bait, fuel, and wage costs, as well as the regulatory changes against lobstermen, this is not what should happen. As explained in section 2.3.0, the 2017 study funded by the ASMFC found that menhaden are price inelastic; meaning that changes in our allowable catch "are not fully compensated by higher prices" (pg 11). Part of the stated objective for section 3.1 is maintaining the current directed fisheries, however reducing the small scale limits would do the complete opposite. You will see the small boat fleet tying up because it will not be worth it to go. Yet another de facto rule to push us out of participation. I do not understand changing our limits other than to show preference to large stakeholders. As a state fishery the decisions made in this addendum should keep its state fisherman at its forethought.

Philip Anthony Powell Jr.
F/V Gannet

From: [Reagan Warren](#)
To: [Comments](#)
Subject: [External] Menhaden
Date: Thursday, September 1, 2022 12:54:37 PM

To try and end seining for menhaden is ridiculous. It is harder and more time consuming to gillnet them. I have the small scale license when the menhaden were around I only got a few. You have to worry about seals getting into it. There is no way that you can catch as many with a gillnet as you can seining

Sent from my iPhone

From: [Roy Whalen](#)
To: [Comments](#)
Subject: [External]
Date: Tuesday, September 20, 2022 11:46:58 AM

Menhaden licensing. Was hoping there could be a change so kids that were in high school or college during the 2019 2020 and 2021 seasons that didn't have a commercial license to have a chance to get one. This was only way for these kids to make some money in spring and early summer before lobsters start. Especially since they are limited on lobsters tags it's a huge help for them for extra income to pay their payments. Thank you! Roy Whalen 207 266 3554

From: [Seth Walker](#)
To: [Comments](#)
Subject: [External] Atlantic menhaden draft addendum 1
Date: Friday, September 30, 2022 4:50:02 PM

Hello my name is Seth walker and I lobster/ scallop fish out of harpswell Maine. I think it's ridiculous that we steam over a pile of menhaden and our pogie fisherman aren't allowed to fish on them because we don't have enough quota. But omega protein holds over 78% of the entire east coast quota. So we have to truck pogies in from other states which are a lot smaller than our menhaden and cost at least \$60 more a drum. That adds at least \$180 to my bait bill and the fish are awful they are small and not in as good of quality as our local fish. I ask you increase our state quota. 3.1 quota allocation 3.1.1 I ask you select option B quota's should be based on fish availability and need 3.1.2 I ask you select option 4a. 3.2 episodic set aside program I ask you select option 2 3.3 incidental / small scale fishery 3.3.1 timing I ask you select option 1 status quo we rely on the small scale fishery immediately to continue a supply of fresh local menhaden 3.3.2 gear type I ask you select option 1 status quo small purse seiners are an important tool to insure only a specific amount of fish are harvested 3.3.3 trip limits I ask you select option 1 status quo any reduction in trip limits would put more pressure on our already evident bait shortage in Maine 3.3.4 I ask you select option 1 status quo Ic / ssf should not be counted towards state allocation or coast wise tac

From: [Shane Carter](#)
To: [Comments](#)
Subject: [External] Atlantic menhaden draft addendum I
Date: Saturday, September 24, 2022 8:39:22 AM

To whom it may concern,

I am a Maine commercial fisherman. We in the gulf of Maine have seen in recent years a substantial uptick in menhaden in our waters. Whether these fish remain in the gulf for years to come is impossible to say. I am for always for using the most up to date data and science to determine a fishery. Things are continually changing in our ecosystem and relying on old or historical data seems irrelevant at this point. We should also strive to protect the stock as best we can. Purse seining the fish has the environmental advantage of allowing live fish to be let go in the case of a quota overage. This is the only alternative that makes any common sense.

Thank you,

Shane carter
FV Emily Catherine
Bar harbor, Maine
Sent from my iPad

From: [Shawn Rich](#)
To: [Comments](#)
Subject: [External]
Date: Tuesday, September 13, 2022 12:39:29 PM

To Whom it may concern,

My name is Shawn Rich and I've been in the commercial fishing industry my whole life! 5 generations of fisherman in our family.

When the Menhaden showed up in Casco bay in numbers not seen in years I decided the catch them for bait. In 2016 I bought a license and a couple small gill nets and started figuring out how to catch them efficiently. We got it down and was catching enough to cut down our bait costs! I told my crew "This is to good , the state is gunna frig it all up." Sure enough the next year the rules started to change. And they have changed and been restricted every year since. Now that we've made huge investments to capitalize on the abundance of fish, rule may change again.....Gillnets are a fine inexpressive way to catch a handful of fish, but its not efficient and its indiscriminate in the sense everything you catch dies. There is no catch and release like with a purse sein. With a purse sein we brail out what we need and release the rest! If you make guys go to gillnetting it will be a disaster! What we have right now can work. Give us more quota. Make the whole season small scale from start to finish. Thank you!

Shawn Rich

From: [Sherman Hutchins](#)
To: [Comments](#)
Subject: [External] Seine
Date: Sunday, September 25, 2022 4:35:08 PM

I'm in favor of keeping the seine in the small scale fishery. And I also want to see a bigger quota. But I'm also in favor of changing how the allocation of Pogies are caught. I would like to start from day one of the fishery at 6000 pounds three days a week. If we got the quote close to 5% I don't think we would be into the small scale fishery till the end of September first of October. It would benefit many more fisherman and would also benefit for lobster bait.
Sent from my iPhone

From: [Steve Kirkpatrick](#)
To: [Comments](#)
Subject: [External] menhaden
Date: Wednesday, September 28, 2022 5:57:27 PM

Simply put, Maine needs to have more quota.

From: [JAYNE CLOUTIER](#)
To: [Comments](#)
Subject: [External] Menhaden Fishery
Date: Friday, September 30, 2022 10:31:56 PM

Hello,

My name is Tom Cloutier.

I've been a lobster fisherman for the last 30 plus years. As times grow more and more unreasonable as far as inflation, fuel, bait and help. Lobster price continues to decline, Unusual with the thought of every other product rising in cost. A cheaper source of bait is needed, our quota for menhaden is just a fraction of Virginia, for what reason? The price of frozen boxed menhaden from other states is ridiculously high. I have seen menhaden here from June to October. What it comes down to is we need more quota for menhaden to supply the lobster industry.

Thank you

3.1. Quota Allocation

3.1.1 -I ask you select Option B, quota's should be based on fish availability and need.

3.1.2- I ask you select Option 4A. I believe a moving average based on the most current years data is the best way to address menhaden availability as well as need. I do not believe using data thats 10 to 12 years old will address the needs of todays fishery. This current year Maines menhaden fishery, including small scale
Email to comments@asmfc.org

Subject line: Atlantic Menhaden Draft addendum 1

From: [tom haslett](#)
To: [Comments](#)
Subject: [External] RE: Menhaden Draft Addendum
Date: Thursday, September 29, 2022 1:43:02 PM

Attn: James Boyle, Atlantic States Marine Fisheries Commission -

As a concerned resident, I am writing to comment on changes in the commercial allocation of menhaden quota. I will open with the observation that the Draft Addendum provided a lot of great information and a very challenging discussion of the various options under consideration. For the sake of brevity and simplicity, I would like to share a few thoughts:

First, as a resident of eastern Maine, the menhaden is a relative newcomer to our waters. In the last five years the fish has contributed to a resurgence of bird activity. Have you ever seen a heron try to catch fish from the air? I've seen interactions between seagulls, heron and crows that I have never seen before in utilizing this food resource. The seal population has increased and I saw a minke whale for the first time in Narraguagus Bay this summer. Put simply, the menhaden have contributed to a surge in avian and marine mammals in a very short time frame. I contextualize this as a measure of how the Gulf of Maine is evolving, and it causes me to question the empirical insights from the data you shared.

Second, the data you shared shows the explosive growth of the Maine fishery extracting menhaden. Recognizing that the decline of herring has raised the value of menhaden as a 'replacement' bait stock - I want to raise an uncomfortable truth. Over the last six decades I have seen dramatic declines in a variety of marine organisms - except the lobster and kelp. Are we going to see the same over-extraction of resources that decimated the green sea urchin, the decline of mussel flats, the paucity of starfish, etc. etc.? Or is there a way forward to establish strict limits on the menhaden catch to ensure that we don't eviscerate this species before it has a chance to establish itself?

Third, the Maine lobster fishery is a fragile story today. Under pressure from a variety of sources: baitfish in short supply, rising costs for fuel, and the existential threat of closure due to the collapse of the Atlantic Right whale populations - there are reasons to be concerned. That can not serve as justification to allow 'economic' short-termism to produce (yet again) an ecological collapse. I would suggest that an overly cautious approach be taken with regard to quota.

This leads then to my critique of the various options detailed in the Draft Addendum. Within the three categories - I could not determine which proposal would put the greatest constraint on the total allowable catch. Moreover, I don't have any knowledge of the base population within the Gulf of Maine or more broadly. What I do know is that natural systems are dynamic and if we try to organize them into our economic models, we are destined to fail. Put another way - amidst the dynamic changes taking place in the Gulf of Maine: rising water temperatures, multiple species moving in and out of these waters, and increasing pressure to extract 'the last fish' - I would ask you to slow down the extraction of menhaden as aggressively as you can.

Thank you for taking the time to consider my thoughts here. I am sorry that I was unable to disentangle the various options that you have laid out. Consider the sum of my thoughts as a vote to make that quota as small as possible within the dynamic waters of the Gulf of Maine.

Sincerely,

Tom Haslett
Partner of Pemetic Sea Farms (LLC registered in Maine)
Resident of Millbridge, Washington Co.

+1 617 943 8301

Atlantic Menhaden Addendum I Public Hearings

*Maine Hearing
September 13, 2022
72 Public Participants*

Staff: James Boyle (ASMFC), Toni Kerns (ASMFC), Megan Ware (ME Commissioner Proxy), Melissa Smith (ME DMR)

Hearing Overview

- All commenters wanted to highlight their concern with removing purse seines as a permitted gear. They were concerned that removing purse seines would cause them to switch to gillnets, which would increase bycatch mortality because fish cannot be released alive, whereas with a purse seine the fishers can release a mixed catch.
- Multiple commenters stated how ME should get the maximum that they can but there should be an avenue to acquire more to fit their needs.
- All attendees supported Option 2 (Increase EESA between 1-5%), and 1 individual reiterated their support in their comment.

Poll Results

By a show of hands vote:

- 3.1.2: All attendees except 1 supported 3.1.2 Option 2 (2018, 2019, 2021). The one exception supported 3.1.2 Option 1 (2009-2011).
- 3.2.1: All attendees supported Option 2 (Increase EESA between 1-5%)
- 3.3.2 All attendees supported 3.3.2 Option 1 (Status Quo) to maintain permitted gear types.

Public Comment Summary

Cody Gillis

- Commented that removing purse seines is ignorant.
- Concerned that between VA and NJ, almost 90% of TAC and influence is consolidated between two states.
- Argued for splitting the quota evenly between states.

Gary Hatch

- Argued that the TAC should be set by available biomass within a state, and we need to know the full biomass to understand that.
- Stated that the menhaden population goes through cycles and that Maine is currently in the flow of a new cycle, similar to past years where they could catch around 60 million pounds.
- Wants the fishery to be able to catch the fish they need while they are on the high end of the cycle before it is gone again.
- In a second comment, supported creating size limits for menhaden to prevent states from catching young menhaden that have not had the chance to reproduce.
 - Same idea supported in a comment by Ryan Miller.
- Further commented that there are two areas on which management needs to focus:

- States catching smaller fish and preventing those fish from reproducing, which affects the ME fishery farther north
- Climate change and its contributions to the instability of the fishery.

Michael Myers

- Commented that cutting the herring fishery has shifted the pressure on menhaden, and that the fishers need to be able to catch their bait in order to remain economically viable.

Nick Nieuwhark

- Commented that quota should be more equally distributed away from VA.

Thomas McLennan (and joined by others)

- Multiple comments that ME fishers should have enough quota to catch their own bait instead of needing to import it from other states and pay the transportation costs.

Dustin Cody

- Commented that the ME lobster fishery is dependent on menhaden and ME needs all of the menhaden quota they can get to continue that fishery.
- In a second comment, stated that ME, and other states, need an avenue to acquire more quota when there is a clear need. Questioned why it should be that a state like ME has to consistently use the IC/SSF provision and shut their fishery while other states have more quota and rarely use the IC/SSF provision.

Daniel Harriman

- Also noted the episodic and cyclical nature of the menhaden fishery in ME.
- Commented that the quota should be equally distributed between the states, and is concerned that in the current system, fishers are forced to choose between begging for quota and fishing illegally.
- Concerned that the regulations only benefit large corporations and not the individual fishers.

Tim Caldwell

- Concerned that the document is not written clearly for fishers and that there are not enough resources for them to find the information in simpler terms.

Doug McLennan

- Commented that ME should remove itself from ASMFC due to concerns about other states and corporations having influence on the state fisheries, and voiced his disappointment in ME's representation.

John Jordan

- Commented that ME needs to be able to increase their quota to account for the increased availability of menhaden as waters warm and the population shifts north.

Lawrence Reed

- Commented that the fishery should be regulated in a way that allows them to fish for the entire season that menhaden are in state waters.

Additional Comments

Michael Myers and Collette Oxtan

- Both attendees commented that the state regulations that dictated the three days they were allowed to fish was too restrictive.

- Both argued that a better system would be to allow each fisher only three days, but let the fisher choose which three days they fish.

David Noonan

- Commented that does not see the reasoning for the state restricting the number of days fishers can fish.

Multiple Commenters

- Four individuals commented that for the first time they are seeing menhaden appear in traps that are 30-40 fathoms deep and in the bellies of tuna, which is a testament to their abundance in the region.

Atlantic Menhaden Draft Addendum I

Atlantic States Marine Fisheries Commission

September 13, 2002

Maine

-- PLEASE PRINT CLEARLY --

<u>Name</u>	<u>Company/Organization</u>	<u>City, State</u>
Nicholas Morly	Steadfast Fisheries	Boothbay ME
Andrew Hollinan	Steadfast Fisheries	Boothbay Harbor, ME
Richard Newcomb	Jen: r- o	Peaks Island ME
Gary Hatch	Galley Hatch Fish	Owls Head - Portland
Lively SINGELL SR		MORRILL ME
JED SPEAR	ROYAL RIVER LOB,	
CAMERON MURPHY	STEPPING STONES SAFETY INC.	PORTLAND ME
Jim Clemons	Insenja Bair	Harpwell ME
John Lyburner	F/V Bona IT	Stonington, ME
Glenn Bishop	F/V Fort's Cold	Eddison ME
Gordon Conwell	F/V Zephyr	Spruce Head ME
Lee Moore	F/V EVERETT OAKLEE	New Harbor, ME
Michael Dawson	F/V KARETH ANN	NEW HARBOR
Del Prentice		Round Pond
David Noonan	FV Hammer Down	Tenants Harbor ME
Mark Gelf	FV Ocean Sky	New Harbor
Timothy Caldwell	caldwell seafoods	Belfast ME
Lucky S. Gyeall	Shedd Mrs S	Belfast me
Stephen Todd	FV Emily Elizabeth	Chabang Fl. ME
Jeff Zied	Jacob and Olessee	Chabang
Will Debert		Brunswick
Karl Pitcher		Friendship
Jeremy Simmons	FV Renewal Emma	Friendship
David Strout	FV misunderstood	SACO ME.
KNOEP Nieuwenh	FV Hannah Jo	Kennabun me
LAWRENCE REED	GOIN' DEEP	S. BRISTOL, ME
Greg Pratt	Ole Rufus	New Harbor, ME
Ross Alex	F/V Kathryn Ann	Rockland ME
Ryan Haskell	FV Decadence	North Haven ME
Sean Haskell	FV Arcades	North Haven ME
Jason Hare	FV EXTREME MEASURES	So. THOMASTON

Maine Menhaden p. 2.

<u>Name</u>	<u>Company/Organization</u>	<u>City, State</u>
Gody Kelly's	Karna Fishworks LLC	Brewsboro, ME
Danny Young		Cushing ME
Kevin Glover	Quick Step	Owl's Head ME
Ryan Miller	Miller Time	Spruce Head
Reginald G. Toben		Cushing
Alan Poland		
Andrew Fayer		Rockport
Andrew Haise	MASTER-BAITER	Waldie
Michael Myers	Alaina olvig	T Har Bar
Patricia McLam	MLA	Branchville ME
Mark Egly		
Samuel	Solo	PENACONN ME
Robert Morris		Tremont + lbo.
Dwain Fall		Tewant Harbor
Doug McKenna	F/V Northely	Spruce Head
Laura McKenna	F/V Northely	Spruce Head
Craig Gantme	F/V Resurrection	Cape Elizabeth
Mike Willey	F/V Catherine G	Harpswell ME
Andrew Landry	F/V	Harpswell ME
James West	F/V. First Impression	Sorrento ME
Tim Oxtoby	F/V Collette Liv	Vinalhaven
Andrew Gypchil	F/V Gumpin II	Vinalhaven
Collette Oxtob	F/V Jaeger	Spruce Head
Dallas Myer	F/L Bill Anglem	Vinalhaven
DANIEL HARRIMAN	F/VHG + F/V DVII	CAPE ELIZABETH



Name
 Mike McLaughlin
 Dustin Cox
 Zach Miller
 Dustin Delano
 John Tracy
 Shaun McLennan
 Ashley McLennan
 Thomas McLennan
 Gabe Gilchrist
 Ryan Ferrer
 Brian RACKHRO
 Wade RACKHRO
 Ursula Nieuwkerk
 Henry Whetham
 John Jordan
 Jeff Patnam

Company/Organization
 Calypso
 Calypso

 FV Manna Jo
 FV Storm Walker
 Captain B

City, State
 Kennebunk Me
 Kennebunk ME
 Matineux
 FRIENDSHIP
 Spruce Head
 Spruce Head
 Spruce Head
 Spruce head ME

 Spruce Head

 Kennebunk
 Chebeague Island
 Yarmouth, ME
 Chebeague ME

Menhaden Public Hearing Draft Addendum I Summary

*Brewer, Maine
September 20, 2022*

Participants: (57 attendees) Earl Small, Jessay Small, Loring Small, Representative Jim Thorne, Mark Bennett, Matt Williams, Chris Sawyer, Nick Heal, Joe Trundy, Calen Plumm, Representative Sherm Hutchins, Sherman Hutchins, Jeremy Thompsin, Clay Rumeey, Jason Colby, Michael Ross, Roy Whalen, Duncan Haass, James McMillan, Patrick Presnell, Edward Damm, Chouan Strongh, Dixon Smith, Isaac Beal, D. Moraisex, Michael Myers, Tim Caldwell, Cody Druenger, Nate Snow, Tanner Handy, Matt Thompson, Cameron Crawford, Kevin Murphy, Shawn Murphy, Kyle Knowles, Matt Lester, David Ames II, Stephanie Ames, Tyler Bernis, Parker Murphy, Jamie Thurlon, Will Detert, Cole McEnroe, Shanon Dyer, Kaleb Dyer, Adam Dyer, Ian Dyer, Stewart Murphy, Michael Roeber, Adam Stanwood, Noah Munk, Kendra Caruso, Dustin Emery, Virginia Olsen, Blaine Olsen, John Lymburner, and one unreadable signature

Staff: Megan Ware (ME DMR), Amanda Ellis (ME DMR), Troy Dow (Marine Patrol), Sean Dow (Marine Patrol)

Summary

The public hearing began at 5:00PM with a presentation of the management alternatives in the Draft Addendum and questions from members of the public.

Show-of-Hands Votes

Following questions, a show-of-hands vote was taken on several options to gather overall perspectives on management alternatives in Draft Addendum I given the number of participants. The show-of-hand votes were as follows:

- **Commercial Allocation:**
 - Option 1 Status Quo (2009-2011): 2
 - Option 2 2018, 2019, and 2021 Data: 36
 - Option 3 Weighted Average: 0
 - Option 4 Moving Average: 8
- **Episodic Events Set Aside:**
 - Option1 Status Quo (1% Set Aside): 0
 - Option 2 Increase Set-Aside Up To 5%: All attendees raised hands in favor (57)
- **Incidental Catch/Small Scale Fishery Gear Types:**
 - Option 1 Status Quo: All attendees raised hands in favor (57)
 - Option 2 No Purse Seines: 0
 - Option 3 Non-Directed Gears Only: 0
- **Incidental Catch/Small-Scale Fishery Trip Limits**
 - Option 1 Status Quo (6,000 lbs Trip Limit): All attendees raised hands in favor (57)
 - Option 2 4,500 lbs Trip Limit: 0
 - Option 3 3,000 lbs Trip Limit: 0

- **Incidental Catch/Small-Scale Fishery Catch Accounting:**
 - Option 1 Status Quo: All attendees raised hands in favor (57)
 - Option 2 IC/SSF Catch Accounting: 0

Individual Comments

Following the show-of-hands votes, individuals were asked to make public comments on Draft Addendum I. The vast majority of comments spoke to the use of purse seines in the IC/SSF fishery. Common themes in the individual public comments include:

- Purse seines should be maintained as a gear type in the small-scale fishery because:
 - many fishermen in Maine rely on purse seines
 - menhaden can be released alive from a purse seine
 - there is less bycatch with a purse seine
- Switching effort to gillnets will:
 - increase fish mortality
 - create concerns with right whales
 - result in more time and fuel used to catch menhaden
- The Commission should consider the size of fish caught in the states, and if they are mature and have spawned
- Maine's quota should be increased to reflect where the fish are being seen
- Quotas should be more equitable amongst the Atlantic coast states
- Menhaden support not only their own fishery but also the lobster fishery in Maine

Summaries of the individual comments are below. Key words high been highlighted for ease of reading.

- Tim C. – The ASMFC looks like a Virginia overflow of pogies and everyone gets the rest. We don't need last year's data; we need a fishery for next year. The process needs to move faster. If the Commission only evaluates **commercial quota** every three years that puts us in a corner, so we need the most we can get. When the Board makes its decision, it should aim to keep as many people employed as long as possible. Instead of Virginia having almost 80% of the quota, you could be employing hundreds of other fishermen and crew in Maine, putting food on the table and supporting local docks. It needs to be brought to the front that there is a human element to this and it shouldn't be about corporate greed. This is an eastern seaboard quota and it should be split up along the east coast and not between two major states.
- Nick H – If a goal of this document is to protect the fishery, then taking **purse seines** out of the small-scale fishery is a poor thing to do. We can take what we need and then release the rest alive with purse seines. You can't release fish alive with a gillnet and that creates a lot more problems. I also raise that restricting the small-scale fishery to gillnets may have implications for the Atlantic Large Whale Take Reduction Plan. New restrictions due to whales may phase gillnets out as a viable option. I recommend staying with status quo.
- Duncan H. – Maine's pogies are a lot bigger than the southern states. I just got barrels from New Jersey, and they are juvenile pogies and very small [see picture attachment to public hearing summary]. Taking account of fish size is important. We don't want small, juvenile pogies caught but we want big pogies to be caught which have already gone through a maturity cycle. With small juveniles, you have to catch a lot more fish to equal a pound compared to mature fish. Maybe this is

a contributing reason why we have so many fish in Maine waters. We can release menhaden alive from **purse seines**. If we get rid of purse seines, there are a lot of folks who have invested a lot of money in hydraulics and the net. If purse seines are eliminated, no one will want to buy this gear because it can't be used. It creates a bad investment.

- Michael M. – I rely on **purse seines** a lot myself to catch bait so I can haul my lobster traps. Purse seines are the most sustainable and effective way to catch menhaden, without killing other resources and harming the fish. Gillnets entangle species and you have to kill them. And what about protected resources like sturgeon? It is absurd to have Options 2 and 3 on gear types. I am in favor of keeping purse seines. We supply mature pogies which have gone through their life cycle, instead of collecting juveniles. They say our menhaden fishery comes and goes every seven years, could this be because Virginia is harvesting juvenile fish? If they overfish menhaden in the Mid-Atlantic, we lose our fish. It is very important not to fish on juvenile menhaden. I also remember that pogies in the 1990's were plentiful and Russian ships were in Rockland Harbor. What happened to all that data? We need more **quota**. I also support keeping status quo on **catch accounting** in the small-scale fishery and status quo for **trip limits** in the small-scale fishery. A lot of us depend on the menhaden fishery, both as a resource itself and for the lobster fishery. It is keeping us going. By removing purse seines we are losing not only income but also bait for another fishery. Everyone is affected by losing purse seines in the small-scale fishery. Not only families and individuals, but it trickles through communities and resources.
- Roy W. – I am in favor of anyone who wants to work. We need to make a living while the resource is here. It has been 20 years since the pogies were here and it's a good thing they showed up given the status of herring. We should have control over our own fishery and not have 10 other states decide to vote against us. I have used gillnets multiple times and you can do it without going over the quota but you have to be smart about it. We should be able to use both **purse seines and gillnets**.
- Tyler B – I support keeping status quo for **purse seining** so we can keep fishing the way we are now. The Commission should take the size of catch into account. If southern states are catching fish that haven't gone through their life cycle that should be considered. In Maine we catch full size fish and in Virginia they are catching juvenile fish. I am for purse seining and the other ways we catch menhaden.
- Adam S. – I support Option 1, no changes to the fishery for **purse seines** and I agree with the other guys on upping our limit. Virginia has a huge fishery that is owned by a Canadian company. We need to keep our own people employed. Why are we selling out to other countries fisheries? Switching to gillnets will also create a gear conflict issue. We dip in and out among other gear [lobster traps] with purse seines. But gillnets drift along and will create conflict with trap gear. This is a big issue in Maine with the dragging of traps and messing up the gillnet.
- Nate S. – We need to adjust the **quota** based on where the fish are being seen. The fishery has changed and we need to keep up with that since we didn't have a fishery back then. We need to harvest in the most responsible way and not harvest juveniles. **Purse seines** prevent us from killing other fish. I also support keeping status quo on **catch accounting** for the small-scale fishery and **trip limits** for purse seines in the small-scale fishery.
- Dixon S. – I support Option 1 on gear type so we can keep **purse seines** for the same reasons everyone has said. With purse seines we can release what we don't need. If they make us all go to gillnets, it puts a lot more fine-plastic in the water and much greater carbon footprint from running boats longer because it takes more time to fish with gillnets. Efficiency is what we strive for and

efficiency is mentioned in the document. I will also note that the fish down south are worth more money if they get rid of our small-scale fishery in Maine.

- Matt W.- This is a community fish. It's been a bad lobstering seasons and there's a lot of uncertainty moving ahead. The menhaden we bring-in offset poor lobster years. If you take **purse seines** away from us next year, it will be even worse. Affordable bait helps us make money and it is breathing air into lobstering communities.
- Chris S. – I am in favor of Option 1 and keeping **purse seines**. It helps us with sustainability and its more protective of the fishery and we're catching mature fish. It protects this fishery just like the gauge [sets min and max size] is with lobstering. I am concerned about states with no interest or investment in the small-scale fishery voting it away for Maine. They want to hammer us because they're saying we're going over our **quota** because our catch has increased, but it's because more fish have shown up. They are trying to shut us down.
- Earl S. – On the small-scale fishery I support Option 1 status quo. I have fished with both gillnets and **purse seines**. It does take a lot more time with gillnets. And there is a lot more bycatch. With purse seines you can release menhaden alive. You can't with a gillnet and you just kill them.
- Jason C. – I support Option 1 to keep **purse seines**. If you want to use a gillnet or purse seine, you should go for it. I like the purse seine because you can let the menhaden go when you get what you need. I am in favor of upping the **quota**.
- Parker M. – Before I was alive, the Russians took every single pogie they could in Blue Hill Bay. What they didn't take washed up on the beaches and died. And now the menhaden have come back. Menhaden are the cheapest bait we have. We let more pogies go than we take. And now we are the problem? Why can't we take our own bait? We use all the menhaden we catch here in Maine and it is a sustainable fishery.
- Representative Sherm Hutchins – There is a lot of good info here. Naturally Option 1 (keep **purse seines**) is the best one. Upping our quota makes sense because we have to truck less fish into the state and that just makes sense.
- Tanner H. – I support Option 1 to keep **purse seines**. You can release what you can't keep with purse seines. Gillnets will result in more plastic in the water and more dead fish. Purse seines are a better option.
- Sherman H. – If we did get our **quota** increased but we changed the trip limit in the beginning of the season, we might not need to make it to the small-scale fishery right away, so that might take us later into the year. More quota would allow us to run longer into the year.
- Noah M. – I am a gillnetter. I heard the word 'sustainable'. I dropped out of high school, so I am a layman. To me, sustainable means longevity of a fishery but doing things presently to get there. There is no other option than a **purse seine**. A gillnet is ludicrous; it is indiscriminatory. That doesn't jive with the word 'sustainable'.



September 20, 2022

Name	Town	Affiliation (if any)
Errol Small	EASTPORT	FISHERMAN
Jessay Small	east port	Fisherman
Loring Small	EASTPORT	Fisherman
Rep Jim Thorne	Carmel	Legislature (MAR)
Mark Bennett	Sorrento	Fisherman
Math Williams	Swans Island	Fisherman
Chris Sanger	Swans Island	Fisherman
Nick Heal	Lincolnville	Fisherman
Joe Trundy	Deer Isle	Fishermen
Galen Plummer	Corea	Fisherman
Rep Sherman Huthy	Brewster	Legislature
Sherman H. Hutchins	Deer Isle	Fisherman
Jerent Thompson	Stonington	FISHERMAN
Clay Roney	Milbridge	Fisherman
Jason Colby	Goldboro	Fisherman
Michael Ross	Stonington	Fisherman
Ry White	South Gouldsboro	Fisherman
Ray Warren	South Gouldsboro	Bill Netter
Duncan Brass	Lamoie	Seine
JAMES McMillan	Lamoie	lobsterman
PATRICK Presnell	So. Gouldsboro	Patrick Prince
Edward Damm	Aancock	Fisherman
Chouan Strongan		

September 20, 2022

Name	Town	Affiliation (if any)
Isaac Beal	Beals	Fishermen
Madhira	Sonesport	Fishermen
Michael Myers	St. George	Al. "
Tim Caldwell	Belfast	Fisherman
Cody Ruzegar	Boothbay	Fisherman
Nate Snow	Bass Harbor	Fisherman
Tanner Handy	Sorrento	Fisherman
Matt Thompson	Stonington	fisherman
Cameron Cumbul	Lamoine	Fisherman
Kevin Murphy	Lamoine	Fisherman
Shawn Murphy	Lamoine	Fisherman
Kyle Knowles	Couldsboro	Fisherman
Matt Lester	Couldsboro	Fisherman
David Ames II	Matinicus	fisherman
Stephanie Ames	Matinicus	fishermen
Cyber Bemis	Matinicus	Fishermen
Parker Murphy	Bass Harbor	Fisherman
Jamie Thurton	Bass Harbor	Fisherman
Will Heterf	Brunswick	Fisherman
Cole McEnroe	Bass Harbor	Fisherman
Shanon Dyer	Vynal Harbor	fisherman
Galeb Dyer	Vynal Harbor	fisherman
Adam Dyer	Vynal Harbor	fisherman

September 20, 2022

Name	Town	Affiliation (if any)
Michael Rober	Warrington	Captain
Adam Starwood	Jonesport	Cap.
Noah Munk	Martinsville	Cap.
Kendra Caruso	Bellevue	TRJ
DUSTIN EMEY	JONESBORO	CAPTAIN
Virginia Olsen	Stonington	Local 207
Blaine Olsen	"	"
John Lymburner	Stonington	Captain

Draft Addendum I to Amendment 3 Public Hearings

*Portsmouth, New Hampshire
Hybrid Hearing
September 7, 2022
9 Participants*

Staff: James Boyle (ASMFC), Toni Kerns (ASMFC), Emilie Franke (ASMFC), Cheri Patterson (NH Commissioner), Ritchie White (NH Commissioner), Dennis Abbott (NH Commissioner Proxy)

Hearing Overview

- 2 commenters expressed support for 3.3.4 Option 2 given the high percentage of IC/SSF landings coastwide and particularly in certain states.
- 1 commenter expressed support for 3.1.1 Option A to maintain equity and allow states with little or no commercial menhaden fishery to keep quota for other purposes.
- 1 commenter expressed support for 3.1.2 Option 2 to align with the most recent availability of the resource.

Poll Results

- **3.1.1 Commercial Allocation Step 1:**
 - Option A Status Quo (0.5%): 1
 - Option B (Three-Tier): 2
- **3.1.2 Commercial Allocation Step 2**
 - Option 1 Status Quo (2009-2011): 0
 - Option 2 2018, 2019, and 2021 Data: 1
 - Option 3 Weighted Average:
 - Sub-option 1: 0
 - Sub-option 2: 0
 - Option 4 Moving Average:
 - 4A (all landings): 0
 - 4B (all landings under TAC): 2
- **3.2.1 EESA:**
 - Option 1 Status Quo (1% Set Aside): 1
 - Option 2 Increase Set-Aside Up To 5%:
 - Sub-option 1 (Static): 1
 - Sub-option 2 (dynamic): 2
- **3.3.1 IC/SSF Timing:**
 - Option 1 Status Quo: 1
 - Option 2 Sector/Fishery/Gear Type: 0
 - Option 3 Entire State Allocation: 2
- **3.3.2 IC/SSF Gear Types:**
 - Option 1 Status Quo: 1 (Supported Sub-option 2)
 - Option 2 No Purse Seines: 1
 - Option 3 Non-Directed Gears Only: 2

- **3.3.3 IC/SSF Trip Limits**
 - Option 1 Status Quo (6,000 lbs Trip Limit): 2
 - Option 2 4,500 lbs Trip Limit: 0
 - Option 3 3,000 lbs Trip Limit: 2

- **3.3.4 IC/SSF Catch Accounting:**
 - Option 1 Status Quo: 1
 - Option 2 IC/SSF Catch Accounting:
 - 2A Modify Trip Limits: 2
 - 2B Modify Gear Types: 0
 - Both 2A and 2B: 2

Public Comment Summary

Kimberly Matthews

- Wanted NH Commissioners to consider the amount of biomass that is removed from IC/SSF landings at the current trip limits and the benefits of 3.3.4 Option 2 considering the high level of IC/SSF landings in other states

Jaclyn Higgins (Representative of Theodore Roosevelt Conservation Partnership)

- Supports 3.1.1 Option A as it is considered the most equitable distribution
 - Commented that states with low landings should not be penalized and felt that the tiered minimum does not consider states that may want to keep fish in their waters for other ecological benefits
- Supports 3.1.2 Option 2 to represent the most recent availability of the resource
- Supports 3.3.4 Option 2
 - Believes IC/SSF landings should be counted against the TAC equal to directed landings due to the percentage of the overall coastwide landings that fall under this provision

New Hampshire Virtual Hearing Attendance Wednesday, September 7, 2022		
First Name	Last Name	Email
Barry	Matthews	oceanventure@aol.com
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Lincoln	Tully	linc.tully@gmail.com
Melissa	Smith	Melissa.Smith@maine.gov
Nichola	Meserve	nichola.meserve@mass.gov
Peter	Himchak	peter.himchak@cookeaqua.com
Toni	Kerns	tkerns@asmfc.org

Atlantic Menhaden Addendum I Public Hearings

Massachusetts Hearing

September 14, 2022

24 Public Participants

Staff: James Boyle (ASMFC), Nichola Meserve (MA Commissioner Proxy), Dan McKiernan (MA Commissioner)

Hearing Overview

- Questions and comments largely concerned how Maine’s IC/SSF landings in recent years have resulted in the options in the document causing Maine’s allocation to potentially increase the most.
 - Commenters were concerned that the potential increases to Massachusetts’ quota in the options is significantly less than Maine because they did not utilize the IC/SSF program.
 - Additional concerns were how the price of menhaden could be driven down by increased catch in Maine.
- 2 commenters expressed their desire to use different methods to reduce Maine’s IC/SSF landings, whether through the Options in 3.3.2 and 3.3.3 or by implementing a state IC/SSF cap.
- 1 commenter for the Stellwagen Bank Charter Boat Association expressed concern for the volume of landings allowed under the IC/SSF provision, and that in sensitive areas (Boston Harbor) it negatively affects the striped bass fishery.
- General sentiment among most participants was that Massachusetts needs a combination of options that will increase and scale its access to the available resource, although participants needed more time to review and consider the specific options and how they would work together.
 - 1 commenter noted the importance of management being able to respond to shifts in species distribution, whether north or south.
- 1 commenter questioned the benefit for MA of the three-tiered minimum allocation approach versus having more quota available for transfers.

Public Comment Summary

Gerry O’Neil

- Commented that it is in Massachusetts’ best interests to end the IC/SSF program to make their fish more valuable and was concerned that Maine is benefitting from using this provision at the expense of other states. Removing purse seines from IC/SSF especially important for the Moving Average allocation option.
- Interested in a mechanism that would allow states to hold on to some amount of quota for use after the EESA so that the fishery could still operate at a small-scale level under quota if gears removed from IC/SSF.

Eric Lorentzen

- Expressed similar concern that Maine is being rewarded for its use of the IC/SSF provision while Massachusetts tried to abide by the intent of the provision, and that an increase in Maine quota will reduce the price for fish.

Mike Pollison

- Commented that states should not be allowed to split their quota into sectors (supports 3.3.1 Option 3).
- Added that a cap should be placed on Maine IC/SSF landings to allow for fish to return south to Massachusetts.

Mike Delzingo (Stellwagen Bank Charter Boat Association)

- Concerned that 6,000 lbs is far too great to be considered an incidental fishery and that menhaden are being depleted in Boston Harbor and not serving their role as a forage fish for other target species, particularly striped bass.

Paul Axelson

- Commented on the importance of management being able to respond to shifts in species distribution, whether north or south.

Atlantic Menhaden Addendum I Public Hearings

Rhode Island Hearing

September 8, 2022

8 Public Participants

Staff: James Boyle (ASMFC), Toni Kerns (ASMFC), Conor McManus (RI Commissioner)

Hearing Overview

- 1 commenter supported increasing the EESA and for maintaining quota in states that may not have menhaden fisheries to allow them the choice to keep quota for game fish or some other reason.

Poll Results

- **3.1.1 Commercial Allocation Step 1:**
 - Option A Status Quo (0.5%): 0
 - Option B (Three-Tier): 2
- **3.1.2 Commercial Allocation Step 2**
 - Option 1 Status Quo (2009-2011): 0
 - Option 2 2018, 2019, and 2021 Data: 3
 - Option 3 Weighted Average:
 - Sub-option 1: 0
 - Sub-option 2: 0
 - Option 4 Moving Average:
 - 4A (all landings): 0
 - 4B (all landings under TAC): 1
- **3.2.1 EESA:**
 - Option 1 Status Quo (1% Set Aside): 1
 - Option 2 Increase Set-Aside Up To 5%:
 - Sub-option 1 (Static): 3
 - Sub-option 2 (dynamic): 1
- **3.3.1 IC/SSF Timing:**
 - Option 1 Status Quo: 2
 - Option 2 Sector/Fishery/Gear Type: 0
 - Option 3 Entire State Allocation: 2
- **3.3.2 IC/SSF Gear Types:**
 - Option 1 Status Quo: 0
 - Option 2 No Purse Seines: 0
 - Option 3 Non-Directed Gears Only: 3
- **3.3.3 IC/SSF Trip Limits**
 - Option 1 Status Quo (6,000 lbs Trip Limit): 1
 - Option 2 4,500 lbs Trip Limit: 0
 - Option 3 3,000 lbs Trip Limit: 3
- **3.3.4 IC/SSF Catch Accounting:**

- Option 1 Status Quo: 2
- Option 2 IC/SSF Catch Accounting:
 - 2A Modify Trip Limits: 3
 - 2B Modify Gear Types: 1
 - Both 2A and 2B: 1

Public Comment Summary

Greg Vespe (Representative of RI Saltwater Anglers' Association)

- Supports 3.2.1 Option 2 but did not specify a sub-option
- Commented desire to allow states without a menhaden fishery to be able to keep quota for other purposes
- Expressed concern that this species needs to be carefully protected given the collapse of the Atlantic herring fishery, and feels that menhaden is the “last man standing”
- Additional comments regarding how states distribute their quotas
 - Would prefer states distribute catch within their waters more evenly to lessen the pressure on ecologically sensitive areas; specifically used the Chesapeake Bay as an example
 - Would prefer states to reevaluate how quotas are distributed to support smaller fishers and fewer large corporations

Rhode Island Hearing Attendance**Thursday, September 8, 2022**

First Name	Last Name	Email
Anna	Webb	anna.webb@mass.gov
Carl	Tiska	carl.tiska@gmail.com
Conor	McManus	conor.mcmanus@dem.ri.gov
Eric	Lorentzen	bellinghamssurfteam@yahoo.com
Greg	Vespe	vespe.risaa@gmail.com
Jaclyn	Higgins	jhiggins@trcp.org
Jason	McNamee	jason.mcnamee@dem.ri.gov
Mike	Jarbeau	mjarbeau@savebay.org
Nichola	Meserve	nichola.meserve@mass.gov
Nicole	Lengyel Costa	nicole.lengyel@dem.ri.gov
Peter	Himchak	peter.himchak@cookeaqua.com
Richard	Fuka	rfuka@gansettcrab.com
Richard	Fuka	captlobster@gmail.com
Robbi	Begi	robbiebegin@gmail.co
Toni	Kerns	tkerns@asmfc.org

Atlantic Menhaden Addendum I Public Hearings

*New York Hearing
September 15, 2022
11 Public Participants*

Staff: James Boyle (ASMFC), Maureen Davidson (NY DEC), Stephanie Rekemeyer (NY DEC)

Hearing Overview

- Comments largely focused on increasing New York's quota through incorporating recent landings as much as possible through the allocation timeframe, with the majority preferring 3.1.2 Option 2, but supporting Option 3A Sub-option 1 if the previous option was not achievable.
- Comments also expressed strong opposition to 3.3.2 Option 3 and the removal of the beach seine fishery in the state. Commenters wanted to emphasize the importance of maintaining existing fisheries and removing the beach seine from the IC/SSF landings would be a considerably detriment to the fishery as a whole and the fishers themselves.

Public Comment Summary

Tom Garay

- Supports 3.1.2 Option 2 to maximize NY quota
- Supports 3.3.2 Option 2 to remove purse seines from the IC/SSF provision
- Supports 3.3.3 Option 1
- Expressed the desire to maintain beach seines in the IC/SSF provision

Will Caldwell (Southampton Baymen's Association)

- Supports 3.1.2 Option 2 to maximize NY quota
 - If not 3.1.2 Option 2, would accept 3.1.1 Option B and 3.1.2 Option 3A Sub-option 1
- Supports 3.3.2 Option 2 to remove purse seines from the IC/SSF provision
 - Expressed strong opposition to Option 3 unless it was modified to protect existing beach seine fishery
 - Added a comment that would like to see beach seines considered separate from haul seines moving forward
- Supports 3.3.3 Option 1
- Also, wanted to give the Board a reminder that prior to 2015 there was no record of NY landings when considering historical landings

Michael Ozkaya

- Supports 3.1.2 Option 2 to maximize NY quota
 - If not 3.1.2 Option 2, would accept Option 3A Sub-option 1
- Supports 3.3.2 Option 2 to remove purse seines from the IC/SSF provision
 - Reiterated concern that Option 3 would be detrimental to the NY fishery
- Supports 3.3.3 Option 1

John Nemeth

- Supports 3.1.2 Option 2 to maximize NY quota
- Supports 3.3.2 Option 2 to remove purse seines from the IC/SSF provision
 - Reiterated concern that Option 3 would be detrimental to the NY fishery
- Supports 3.3.3 Option 1

Atlantic Menhaden Addendum I Public Hearings

New Jersey Hearing

September 27, 2022

4 Public Participants

Staff: James Boyle (ASMFC), Toni Kerns (ASMFC), Tracey Bauer (ASMFC), Joe Cimino (NJ Commissioner)

Hearing Overview

- 1 commenter expressed their feeling that northern states have fewer regulations of the menhaden fishery and are being rewarded for catching more than their quota, while NJ worked to stay within its quota including closing the fishery
- 1 commenter expressed their concern that the options do not address what they consider to be the true issue, which is water quality and pollution

Poll Results

- **3.1.1 Commercial Allocation Step 1:**
 - Option A Status Quo (0.5%): 2
 - Option B (Three-Tier): 0
- **3.1.2 Commercial Allocation Step 2**
 - Option 1 Status Quo (2009-2011): 1
 - Option 2 2018, 2019, and 2021 Data: 1
 - Option 3 Weighted Average: 1 voted with no follow up on sub-option
 - Sub-option 1: 0
 - Sub-option 2: 2
 - Option 4 Moving Average:
 - 4A (all landings): 0
 - 4B (all landings under TAC): 0
- **3.2.1 EESA:**
 - Option 1 Status Quo (1% Set Aside): 3
 - Option 2 Increase Set-Aside Up To 5%:
 - Sub-option 1 (Static): 1
 - Sub-option 2 (dynamic): 0
- **3.3.1 IC/SSF Timing:**
 - Option 1 Status Quo: 2
 - Option 2 Sector/Fishery/Gear Type: 0
 - Option 3 Entire State Allocation: 2
- **3.3.2 IC/SSF Gear Types:**
 - Option 1 Status Quo: 1
 - Option 2 No Purse Seines: 2
 - Option 3 Non-Directed Gears Only: 1
- **3.3.3 IC/SSF Trip Limits**
 - Option 1 Status Quo (6,000 lbs Trip Limit): 0
 - Option 2 4,500 lbs Trip Limit: 1
 - Option 3 3,000 lbs Trip Limit: 2

- **3.3.4 IC/SSF Catch Accounting:**
 - Option 1 Status Quo: 2
 - Option 2 IC/SSF Catch Accounting:
 - 2A Modify Trip Limits: 1
 - 2B Modify Gear Types: 0
 - Both 2A and 2B: 1

Public Comment Summary

Jeff Kaelin (Representative of Lund’s Fisheries)

- Supports 3.1.1 Option B
- Supports 3.1.2 Option 3A Sub-option 2
 - Commented that it is fair to weight the historical and recent landings equally
- Supports 3.2.1 Option 1
- Supports 3.3.1 Option 1
 - Commented that the NJ system of dividing the state quota by sector works well and wants it to continue
- Supports 3.3.2 Option 2
 - Commented belief that even at the size limit, purse seines can catch far more than the IC/SSF trip limit and simply dump fish to transport boats to bypass the limit
 - Fundamentally opposed to considering purse seines as small SSF
- Supports 3.3.3 Option 1
 - Commented desire to maintain limit specifically for gillnets
- Supports 3.3.4 Option 2
 - Commented that some action must be taken, whether trip limits or gear types, and that Option 2 would protect states that remain within their limits and report landings accurately

James Fletcher

- Expressed confusion at the document as a whole and disappointment that the Commission is not increasing landings of fish
- Expressed concern that the addendum does not consider water quality and pollution, as they feel that is the biggest threat facing all fisheries

Virtual Public Hearings for Atlantic Menhaden Draft Addendum I - September 27, 2022

Attendee Report: New Jersey

Batsavage	Chris	chris.batsavage@ncdenr.gov
Bauer	Tracey	tbauer@asmfc.org
Brust	Jeffrey	Jeffrey.Brust@dep.nj.gov
Celestino	Michael	mike.celestino@dep.nj.gov
Cimino	00-Joe	joseph.cimino@dep.nj.gov
Corbett	Heather	heather.corbett@dep.nj.gov
Fletcher	James	unfa34@gmail.com
Higgins	Jaclyn	jhiggins@trcp.org
Himchak	Peter	peter.himchak@cookeaqua.com
Kaelin	Jeff	jkaelin@lundsfish.com
Kerns	Toni	tkerns@gmail.com
Madsen	Shanna	shanna.madsen@mrc.virginia.gov

Atlantic Menhaden Addendum I Public Hearings
Hearing for Delaware, Maryland, and Potomac River Fisheries Commission
September 26, 2022
10 Public Participants

Staff: James Boyle (ASMFC), Toni Kerns (ASMFC), Dustin Leaning (ASMFC), Lynn Fegley (MD Commissioner), John Clark (DE Commissioner), Marty Gary (PRFC Commissioner)

Hearing Overview

- 2 commenters expressed concern over the quantity of coastwide quota that goes to VA, specifically to the reduction fishery
 - 1 of those commenters wanted it on the record that he did not participate in the polling because of the large difference between the quota that goes to VA compared to the amount of quota that other states can hope to gain through the options in the document

Poll Results

- **3.1.1 Commercial Allocation Step 1:**
 - Option A Status Quo (0.5%): 1
 - Option B (Three-Tier): 5
- **3.1.2 Commercial Allocation Step 2**
 - Option 1 Status Quo (2009-2011): 0
 - Option 2 2018, 2019, and 2021 Data: 2
 - Option 3 Weighted Average: 1 voted with no follow up on sub-option
 - Sub-option 1: 0
 - Sub-option 2: 1
 - Option 4 Moving Average:
 - 4A (all landings): 1
 - 4B (all landings under TAC): 1
- **3.2.1 EESA:**
 - Option 1 Status Quo (1% Set Aside): 0
 - Option 2 Increase Set-Aside Up To 5%: 0
- **3.3.1 IC/SSF Timing:**
 - Option 1 Status Quo: 2
 - Option 2 Sector/Fishery/Gear Type: 4
 - Option 3 Entire State Allocation: 1
- **3.3.2 IC/SSF Gear Types:**
 - Option 1 Status Quo: 2
 - Option 2 No Purse Seines: 4
 - Option 3 Non-Directed Gears Only: 2
- **3.3.3 IC/SSF Trip Limits**
 - Option 1 Status Quo (6,000 lbs Trip Limit): 2
 - Option 2 4,500 lbs Trip Limit: 2
 - Option 3 3,000 lbs Trip Limit: 4

- **3.3.4 IC/SSF Catch Accounting:**
 - Option 1 Status Quo: 2
 - Option 2 IC/SSF Catch Accounting:
 - 2A Modify Trip Limits: 1
 - 2B Modify Gear Types: 1
 - Both 2A and 2B: 2

Public Comment Summary

Kevin McManaman

- Commented that recreational fishers believe that too much of the quota goes to the VA reduction fishery and would like it reduced to protect biomass and water quality
 - Followed up with concern that current quota distribution goes against ASMFC stated goal to make equitable quotas

Chris Moore (Representative of Chesapeake Bay Foundation)

- Supports 3.2.1 Option 2 to increase the set aside
- Supports 3.3.1 Option 2 or 3
 - Commented that they would like to see states unable to use system to catch under IC/SSF provision faster and are sure to catch all of quota first
- Supports 3.3.2 Option 3
 - Commented that purse seines are directed gears and should be considered as such
- Supports 3.3.4 Option 2B Sub-option 1:

Lenny Rudow

- Commented to include it in the record that he did not participate in polling due to disparity between VA quota and the potential quotas for other states

**Virtual Public Hearings for Atlantic Menhaden Draft Addendum I - Septer
Delaware, Maryland, Potomac River Fisheries Commission**

Attendee Report

Last Name	First Name	Email Address
Braun	Ingrid	ingrid.prfc@gmail.com
Clark	John	john.clark@delaware.gov
Colden	Allison	acolden@cbf.org
Colson Leaning	Dustin	dleaning@asmfc.org
Fuller	Jeanne	harborbait@outlook.com
Frignoca	Ivy	ifrignoca@cascobay.org
Gallup	Bruce	sllama@megalink.net
Gary	Marty	martingary.prfc@gmail.com
Genovese	Paul	paul.genovese@maryland.gov
Gillingham	Lewis	lewis.gillingham@mrc.virginia.gov
Harrington	Amalia	amalia.harrington@maine.edu
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Meserve	Nichola	nichola.meserve@mass.gov
Miller	Roy	fishmaster70@comcast.net
Moore	Chris	cmoore@cbf.org
Rickabaugh	Harry	harry.rickabaugh@maryland.gov
Rudow	Lenny	Lenny@fishtalkmag.com
Thibodeau	Jack	jack.thibodeau@nya.org
Zlokovitz	Erik	Erik.Zlokovitz@maryland.gov

Atlantic Menhaden Addendum I Public Hearings

Virginia Hearing
September 21, 2022
53 Public Participants

Staff: James Boyle (ASMFC), Robert Beal (ASMFC), Jamie Green (VA Commissioner), Pat Geer (VA Commissioner Proxy), Shanna Madsen (VMRC)

Hearing Overview

- Comments largely focused on concerns that a reduction in VA quota would lead to lost fishery jobs and the impacts on the local community.
- Comments also frequently questioned states without menhaden fisheries continuing to have menhaden quota to the detriment of states with active fisheries.

Poll results

- **3.1.1 Commercial Allocation Step 1:**
 - Option A Status Quo (0.5%): 2
 - Option B (Three-Tier): 46
- **3.1.2 Commercial Allocation Step 2**
 - Option 1 Status Quo (2009-2011): 0
 - Option 2 2018, 2019, and 2021 Data: 1
 - Option 3 Weighted Average:
 - Sub-option 1: 0
 - Sub-option 2: 53
 - Option 4 Moving Average:
 - 4A (all landings): 0
 - 4B (all landings under TAC): 0
- **3.2.1 EESA:**
 - Option 1 Status Quo (1% Set Aside): 53
 - Option 2 Increase Set-Aside Up To 5%: 1 with no sub-option
- **3.3.1 IC/SSF Timing:**
 - Option 1 Status Quo: 0
 - Option 2 Sector/Fishery/Gear Type: 1
 - Option 3 Entire State Allocation: 0
- **3.3.2 IC/SSF Gear Types:**
 - Option 1 Status Quo: 0
 - Option 2 No Purse Seines: 1
 - Option 3 Non-Directed Gears Only: 0
- **3.3.3 IC/SSF Trip Limits**
 - Option 1 Status Quo (6,000 lbs Trip Limit): 0
 - Option 2 4,500 lbs Trip Limit: 0
 - Option 3 3,000 lbs Trip Limit: 0
- **3.3.4 IC/SSF Catch Accounting:**
 - Option 1 Status Quo: 0

- Option 2 IC/SSF Catch Accounting: 2 with no sub-option
 - 2A Modify Trip Limits: 0
 - 2B Modify Gear Types: 0
 - Both 2A and 2B: 0

Public Comment Summary

Taylor Deihl

- Commented their desire for the Board to protect established jobs rather than create new jobs elsewhere
- Expressed concern for her husband’s job as a fish spotter if quota reductions led to job cuts and noted how the specific skills for working in the industry are difficult to transfer to other jobs in the area with comparable benefits
- Asked why FL, with a net ban, and states with no menhaden fishery receive quota only for it to be unused
- Asked why VA, with historically largest fishery, sees decreases in quota while other states’ quotas are increasing

Ken Pinkard

- Supports 3.1.1 Option B to create three tiers for minimum allocations
- Supports 3.1.2 Option 3A Sub-option 2
- Expressed concern for a potential loss of fishery jobs in the area and noted as a former VP of a fishers union that he has seen opportunities decrease since 2012 and that these jobs are unique opportunities for good wages with a turnover of less than 3%

Ben Landry (Representative of Omega Protein)

- Supports 3.1.1 Option B to create three tiers for minimum allocations
 - In comment, asked why states without menhaden fisheries receive menhaden quota and stated that all it serves is to remove quota from active fishers
- Supports 3.1.2 Option 3A Sub-option 2
- Expressed concern for the economic impacts of reduced quotas, including the lowering of the Chesapeake Bay Cap over time
- Commented that he does not see a method to increase VA quota while other states use quota transfers, and does not feel it is equitable to give recent landings greater weight and reward states for going over their quota

Patrice Noel

- Expressed concern for her family and livelihood if quota reductions cause her husband to lose his job with Ocean Harvesters

Monty Deihl (Representative of Ocean Harvesters)

- First, noted that the local fishers union had 150 members 11 years ago and is now down to 90, and that most of those losses occurred in 2012 from the introduction of the fixed minimum.
- Commented that states without menhaden fisheries should not have menhaden quota that could go to VA or ME and preventing those fishers from catching menhaden

AJ Erskine (Representative for Mid-Atlantic Bait)

- Supports 3.1.2 Option 3A Sub-option 2

- Commented that VA has the market to increase landings but not the quota and asked why with stock assessments showing a healthy stock that we cannot increase the quota overall to help all of the states that need it
- Noted a desire to see pound nets continue to catch under the IC/SSF provision

Chris Moore (Representative of Chesapeake Bay Foundation)

- Supports VA being able to continue dividing their quota by sector, per 3.3.1
- Supports 3.3.2 Option 2 because of the directed nature of purse seines

Andy Hall (General Manager of Omega Protein)

- Expressed concern that continued reductions lead to lost jobs, which is also contributing to younger generations seeking opportunities elsewhere, and voiced opposition to any measures that decreases the reduction fishery quota

Atlantic Menhaden Draft Addendum 1

Atlantic States Marine Fisheries Commission

September 21, 2000

Virginia

-- PLEASE PRINT CLEARLY --

<u>Name</u>	<u>Company/Organization</u>	<u>City, State</u>
Tamara Hull	Omega Protein	Reedville VA
Hudly Hull	Omega Protein	Reedville VA
RANNIE BRAY	OMEGA PROTEIN	Reedville VA
Karen Parker	UFCW/Omega	Reedville VA
RUSSEL FERGUSON	OMEGA	LANCASTER VA
Allen Davis	OMEGA Protein	Reedville, VA
Hannah Long	omega protein	Reedville, VA
Samy Abbott	omega protein	Reedville VA
Ka Washington	omega Protein	Reedville, VA
Rodney Ball	Omega Protein	Reedville va.
Xavier Hudball	Omega protein	Reedville va.
Allen Hudson	omega Protein	Reedville, VA
Tom Parker	Omega	Reedville VA
Dwayne Long	Omega Protein	Reedville VA
Rynell Ball	Omega Protein/FishBait	Reedville VA
Brandon Cochrell	Omega Protein	Reedville VA
Taylor Dehl	Omega Protein	Reedville, VA
Patrice Noel	Omega Protein	Reedville, VA
Joanne Hinson	Omega Protein	Reedville
Renaie Butler	Omega Protein	Reedville
CEAIG FREEMAN	VMEC MMAC	Payson VA
Bailey, Loring	Omega	Reedville, VA
Stanford Parker	Omega	Westhempden
Jane Coe Wether	Omega Protein	Reedville, VA
ROBERT CARRERI	ADONAUTUS	Essex, VA
Deborah Butler	omega protein	Reedville, VA
Hudson, Andrew	omega protein	Reedville, VA
Steve Thomas	Omega Protein	Reedville, VA
Knell	omega protein	Reedville, VA
Chris Moore	C.B.F.	VA Beach, VA
Roger O'Brien	Omega Protein	Reedville, VA

Name
 Jimmy F. [unclear]
 Paul M Jackson
 Marg [unclear]
 W 9th English
 Jordan Chinn
 Damon Cottrell
 Marily [unclear]
 S. LAKE COASTAL
 Ben Landry
 Vance L. Groat
 AS ERSKINE
 Zachary Kurs
 Steve Higginbotham
 Michelle Plauer
 Pat Geer

Company/Organization
 omega protein
 Omega Protein
 Omega Protein
 AMPRO
 Omega Protein
 Ocean Harvesters
 MID-ATLANTIC BAIT, INC
 omega Protein
 VMRC
 MID-ATLANTIC BAIT
 Omega Protein
 OMEGA
 omega Protein
 VMRC

City, State
 Reedville Va
 Reedville Va
 Reedville VA
 Reedville VA
 Lottsburg, VA
 Reedville, VA
 VA
 Reedville, Va
 Mathews Va
 White Stone, VA
 Hampton, VA



Atlantic States Marine Fisheries Commission

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MEMORANDUM

TO: Atlantic Menhaden Management Board
FROM: Atlantic Menhaden Technical Committee
DATE: October 20, 2022
SUBJECT: Stock Projection Memo

The Atlantic Menhaden Management Board (Board) will discuss the 2023-2025 total allowable catch (TAC) for Atlantic menhaden at its November 2022 meeting. Per Amendment 3, the TAC is set through Board action, either on an annual basis or for multiple years, based on the best available science. If the Board does not set a TAC for 2023 by the Annual Meeting, next year's TAC will automatically be set at the level of the 2022 TAC (194,400 mt). Since the implementation of coastwide quota management the TAC has been set at the following levels: 170,800 metric tons (2013–2014); 187,880 metric tons (2015–2016); 200,000 metric tons (2017); 216,000 metric tons (2018–2020); and 194,400 metric tons (2021-2022).

At the August meeting, the Board tasked the Atlantic Menhaden Technical Committee (TC) with developing projections using the ecological reference points (ERPs) and the single-species assessment model (Beaufort Assessment Model, or BAM). Specifically, the Board requested the following projections:

- The TACs that have a 40%–60% probability of exceeding the ERP target, in 5% increments using 2023-2025 combined and as separate years.
- The percent risk of exceeding the ERP target and threshold if the current TAC was changed by -10% to +10% in 5% increments, including 0% (the current TAC).

This memo outlines the methods for the projections and the results of the analysis the Board requested to support the specifications process.

TAC Setting Process

As in recent years, the TAC has been informed by the results of projection analysis, which explores a range of TAC alternatives to determine the percent risk of exceeding the ERP reference points adopted in 2020:

- **ERP target:** the maximum fishing mortality rate (F) on Atlantic menhaden that sustains Atlantic striped bass at their biomass target when striped bass are fished at their F target
- **ERP threshold:** the maximum F on Atlantic menhaden that keeps Atlantic striped bass at their biomass threshold when striped bass are fished at their F target.

Monte Carlo Bootstrap (MCB) runs of the base model run from the BAM are used as the basis for the projection analysis (see stock assessment update report for details on BAM base run and MCB runs; ASMFC 2022).

The projections have the same methods and assumptions as those run for the benchmark assessment. It is important to note that key uncertainties about natural mortality and fecundity are accounted for in the projections. Additionally, during the benchmark assessment (SEDAR 2020), the SAS used a new procedure for projecting recruitment. Instead of assuming a static median value for recruitment, as is done for many assessment projection methodologies and as was done in the past, recruitment was projected using nonlinear time series analysis methods (Deyle et al 2018). Nonlinear time series analysis methods project recruitment based on how recruitment has changed in the past under similar conditions. This is done for each MCB run to account for uncertainty. Thus, uncertainty is recognized in the recruitment time series and the methods used for projections adequately accounted for that uncertainty using the best scientific methods available. As usual, projections are highly uncertain and subject to model assumptions (i.e., no changes in fishing effort, seasonality of the fishery is not modeled, there is no structural model uncertainty in projections).

An additional source of uncertainty that is not fully captured by the MCB approach is the retrospective pattern in the update (ASMFC 2022), as well as the potential impacts of the 2020 and 2021 data issues on the terminal year estimates of abundance. The TC noted that the retrospective analysis in the update showed a more consistent pattern of underestimating F and overestimating fecundity in the terminal year of the assessment compared to the benchmark assessment. The NEFSC (Legault 2020) and ICES (2020) provide recommendations about when to adjust for a retrospective pattern in projections for management use. The NEFSC uses adjusted estimates of abundance-at-age in projections when the retrospectively adjusted terminal year estimates of spawning stock biomass and F are outside the 90% confidence intervals of the unadjusted estimates (Legault 2020). ICES recommends adjusting projections for short-lived species, like menhaden, if the Mohn's rho value for spawning stock biomass is greater than 0.3 or the Mohn's rho value for F is less than -0.22, or if two of three or three of five peels fall outside the confidence intervals of the terminal year run (ICES 2020). For menhaden, the NEFSC guidelines indicated an adjustment was appropriate and the ICES guidelines indicated it was not necessary. The TC elected not to adjust the projections for the retrospective pattern, due to the conflicting advice given by the NEFSC and ICES guidelines and the lack of formal ASMFC guidance, as well as the uncertainty as to whether the retrospective pattern would persist in the future to the same degree or direction. However, the TC does note this as a source of uncertainty that is not well quantified in the projections, and the Board may wish to adjust their risk tolerance accordingly. In addition, the TC recommended that the issue of retrospective adjustments be looked at more thoroughly by the Commission's Assessment Science Committee so that consistent guidelines can be established for all of the Commission's assessments.

Results

One of the Board requests was to provide TACs that have a 40%-60% probability of exceeding the ERP target, in 5% increments, using 2023-2025 combined and as separate years. For the

projections using 2023-2025 as separate years, a TAC has been calculated to provide a TAC that does not exceed the level of risk for any year, or the lower of the three TACs provided in Table 1. The second request from the Board was to calculate the percent risk of exceeding the ERP target and threshold if the current TAC was changed by -10% to +10% in 5% increments. The results are presented in Table 2. Additionally, the TC notes that a TAC in 2023 does affect the TAC in 2024 and 2025 and therefore a value may not have the same associated risk in Tables 1 and 2.

Instead of providing figures for all the of scenarios the Board requested, the TC provided figures of the fecundity, recruits, full fishing mortality rate (F), and landings for the current TAC, a TAC of 174,960 mt (10% decrease to TAC), and the scenario where the risk of exceeding the ERP target in 2023- 2025 was 60% (Figures 1-3). These three plots provide the bounds of the highest and lowest risk scenarios in addition to the current TAC (194,400 mt).

References

- Atlantic States Marine Fisheries Commission (ASMFC). 2022. Atlantic Menhaden Stock Assessment Update. Arlington, VA. 135 pp.
- Deyle, E., A.M. Schueller, H. Ye, G.M Pao, and G. Sugihara. 2018. Ecosystem-based forecasts of recruitment in two menhaden species. *Fish and Fisheries* 19: 769-781.
- ICES. 2020. Workshop on Catch Forecast from Biased Assessments (WKFORBIAS; Outputs from 2019 Meeting). ICES Scientific Reports. 2:28. 38 pp. Available online at: https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/Fisheries%20Resources%20Steering%20Group/2020/WKFORBIAS_2019.pdf
- Legault, C.M. 2020. Rose vs. Rho: a comparison of two approaches to address retrospective patterns in stock assessments. *ICES Journal of Marine Science* 77: 3016–3030. Available online at: <https://academic.oup.com/icesjms/article/77/7-8/3016/5986648>
- Southeast Data, Assessment, and Review (SEDAR). 2020. SEDAR 69 - Atlantic Menhaden Single-Species Benchmark Stock Assessment and Peer Review Report. SEDAR, North Charleston, SC. 691 pp.

Table 1. The TACs associated with a 40-60% probability of exceeding the ERP target (0.19) for 2023-2025 combined and as separate years.

Probability of Exceeding the ERP Target	TAC for 2023-2025	TAC for 2023	TAC for 2024	TAC for 2025
40%	259,500	290,900	271,100	259,500
45%	270,500	303,800	281,800	270,500
50%	284,600	318,600	294,100	284,600
55%	301,000	335,100	308,200	301,000
60%	326,500	350,200	326,500	329,700

Table 2. Percent risk of exceeding the ERP target (0.19) and ERP threshold (0.57) for five different total allowable catch (TAC) projections.

TAC	Probability of Exceeding ERP Target			Probability of Exceeding ERP Threshold		
	2023	2024	2025	2023	2024	2025
174,960 mt (-10%)	0%	0%	2%	0%	0%	0%
184,680 mt (-5%)	0%	1%	3%	0%	0%	0%
194,400 mt (current TAC)	0%	1%	6%	0%	0%	0%
204,120 mt (+5%)	0%	4%	10%	0%	0%	0%
213,840 mt (+10%)	0%	8%	14%	0%	0%	0%

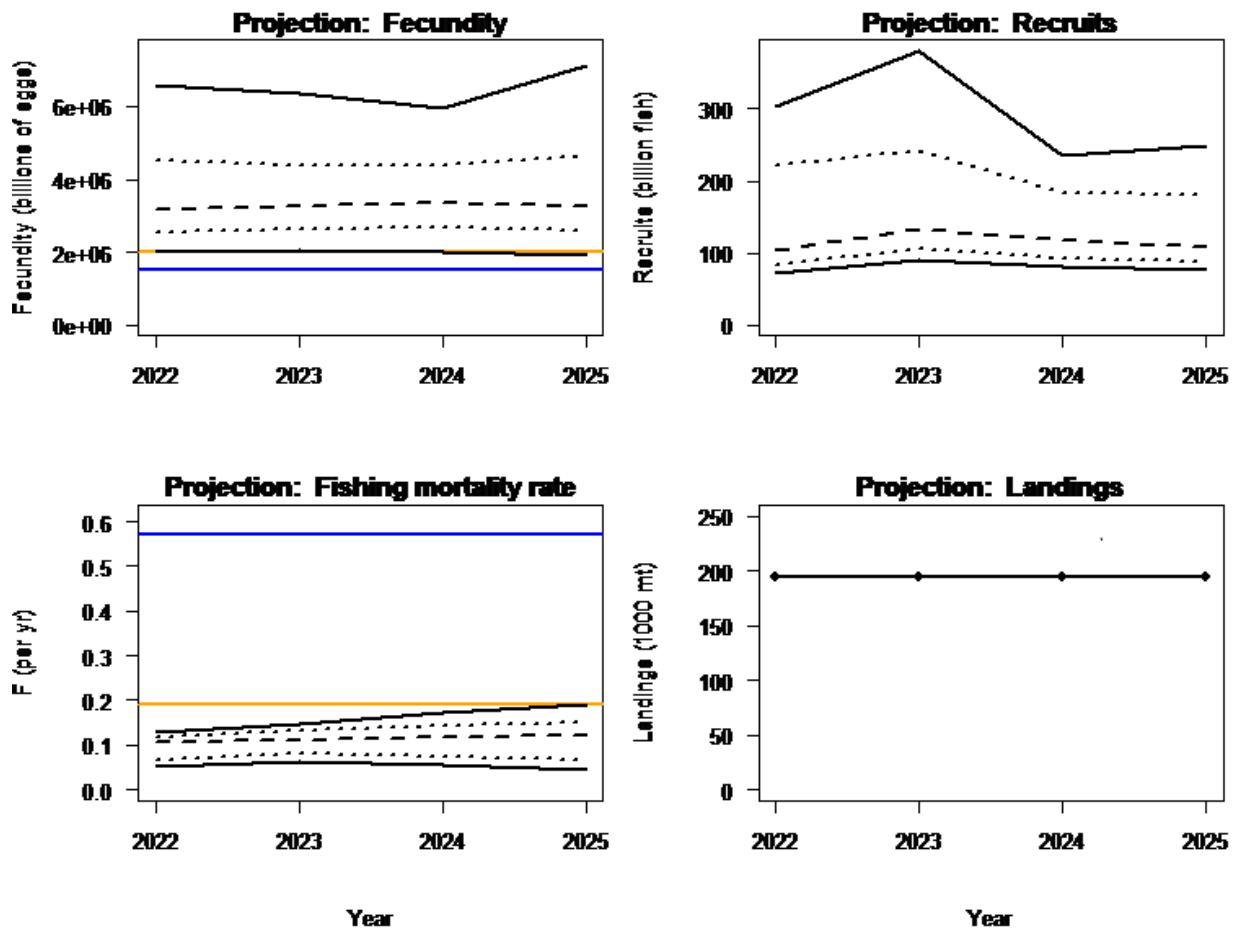


Figure 1. Fecundity, recruits, full fishing mortality rate, and landings for projections done with the current TAC of 194,400 mt. The blue lines indicate the ERP thresholds and the orange lines indicate the ERP targets. The dashed black line is the 50th percentile (median), the dotted black lines are the 25th and 75th percentiles, and the solid black lines are the 5th and 95th percentiles.

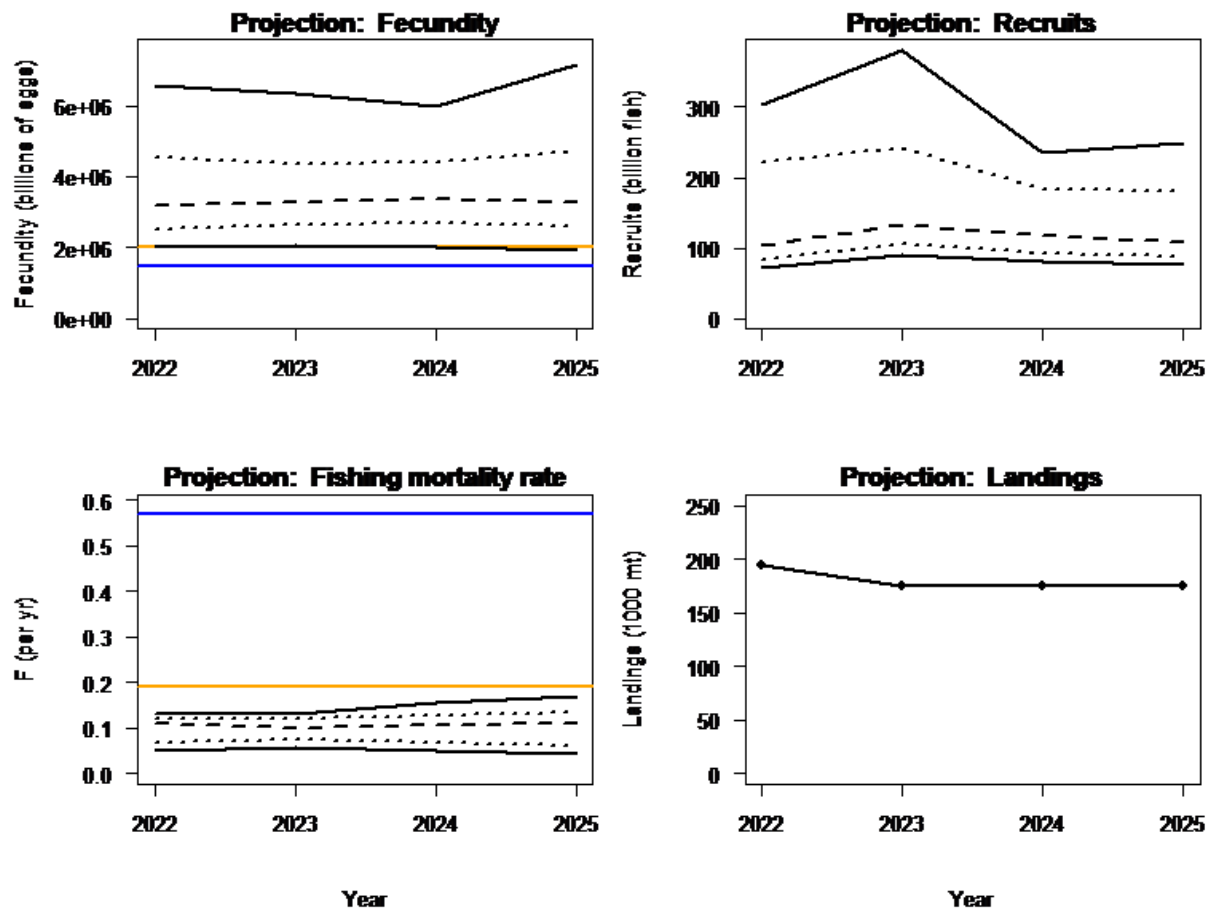


Figure 2. Fecundity, recruits, full fishing mortality rate, and landings for projections done with a TAC of 174,960 mt, representing a 10% decrease to the current TAC. The blue lines indicate the ERP thresholds and the orange lines indicate the ERP targets. The dashed black line is the 50th percentile (median), the dotted black lines are the 25th and 75th percentiles, and the solid black lines are the 5th and 95th percentiles.

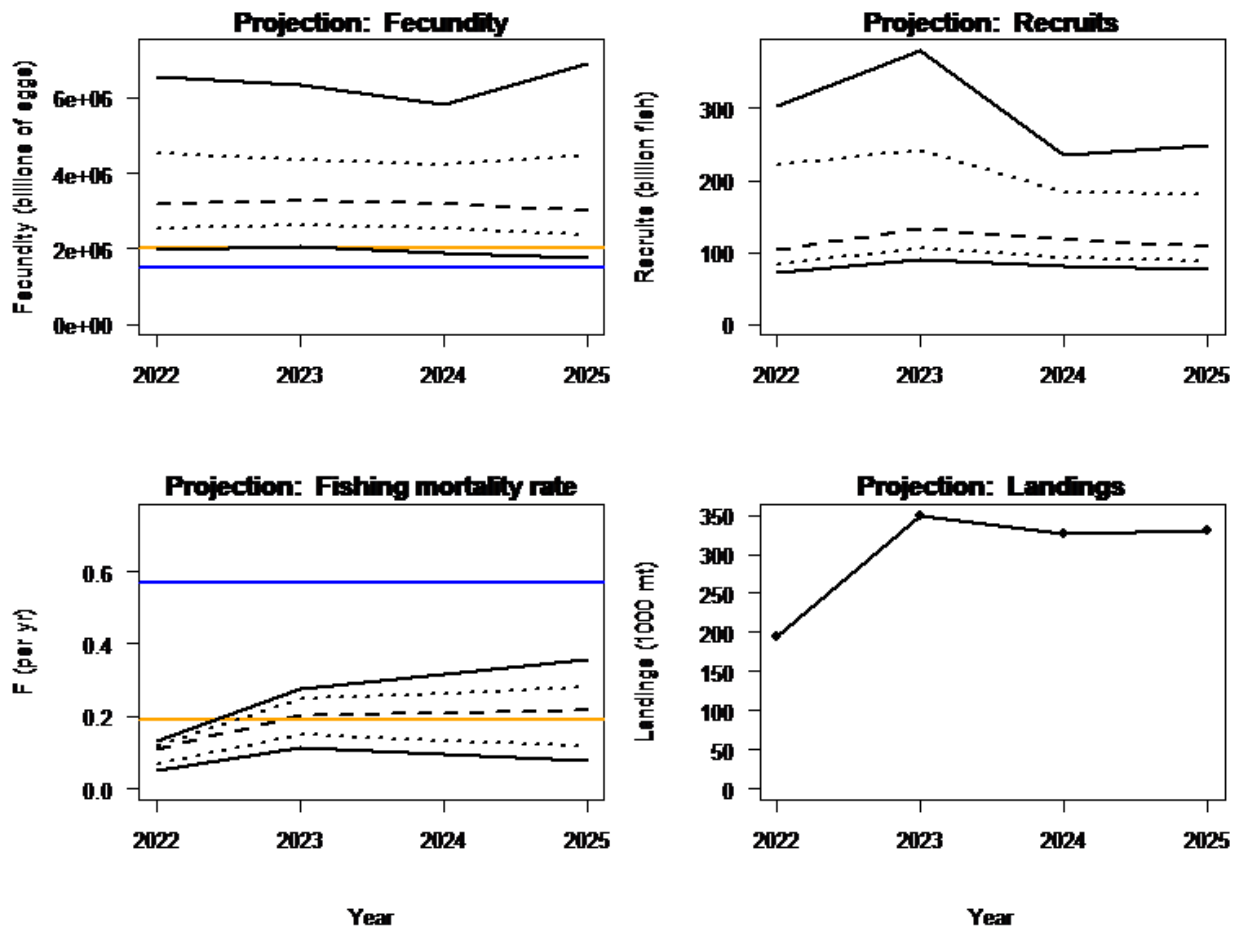


Figure 3. Fecundity, recruits, full fishing mortality rate, and landings for projections that result in a 60% risk of exceeding the ERP target in 2023-2025. The blue lines indicate the ERP thresholds and the orange lines indicate the ERP targets. The dashed black line is the 50th percentile (median), the dotted black lines are the 25th and 75th percentiles, and the solid black lines are the 5th and 95th percentiles.

Atlantic States Marine Fisheries Commission

Horseshoe Crab Management Board

November 10, 2022

9:00 - 11:30 a.m.

Hybrid Meeting

Draft Agenda

The times listed are approximate; the order in which these items will be taken is subject to change; other items may be added as necessary.

1. Welcome/Call to Order (*J. Clark*) 9:00 a.m.
2. Board Consent 9:00 a.m.
 - Approval of Agenda
 - Approval of Proceedings from August 2022
3. Public Comment 9:05 a.m.
4. Consider Addendum VIII on Implementation of Recommended Changes from 2021 Adaptive Resource Management (ARM) Revision and Peer Review Report for Final Approval **Final Action** 9:15 a.m.
 - Consider Public Comment Summary (*C. Starks*)
 - Consider Advisory Panel Report (*B. Hoffmeister*)
 - Consider Final Approval of Addendum VIII
5. Set 2023 Delaware Bay Harvest Specifications **Final Action** 10:30 a.m.
 - Review Horseshoe Crab and Red Knot Abundance Estimates and ARM Model Results (*J. Sweka*)
 - Set 2023 Specifications (*C. Starks*)
6. Review and Populate Work Group to Review Best Management Practices for Handling Biomedical Collections (*C. Starks*) **Action** 11:10 a.m.
7. Consider Fishery Management Plan Review and State Compliance for 2021 Fishing Year (*C. Starks*) **Action** 11:20 a.m.
8. Other Business/Adjourn 11:30 a.m.

The meeting will be held at The Ocean Place Resort (1 Ocean Boulevard, Long Branch, NJ 07740; 732.571.4000) and via webinar; click [here](#) for details

MEETING OVERVIEW

Horseshoe Crab Management Board Meeting
November 10, 2022
9:00 - 11:30 a.m.
Hybrid Meeting

Chair: John Clark (DE) Assumed Chairmanship: 1/22	Horseshoe Crab Technical Committee Chair: Natalie Ameal (RI)	
Vice Chair: Justin Davis (CT)	Horseshoe Crab Advisory Panel Chair: Brett Hoffmeister (MA)	Law Enforcement Committee Representative: Nick Couch (DE)
Delaware Bay Ecosystem Technical Committee Chair: Wendy Walsh (FWS)	Adaptive Resource Management Subcommittee Chair: Dr. John Sweka (FWS)	Previous Board Meeting: August 3, 2022
Voting Members: MA, RI, CT, NY, NJ, DE, MD, DC, PRFC, VA, NC, SC, GA, FL, NMFS, USFWS (16 votes)		

2. Board Consent

- Approval of Agenda
- Approval of Proceedings from August 3, 2022

3. Public Comment – At the beginning of the meeting public comment will be taken on items not on the agenda. Individuals that wish to speak at this time must sign-in at the beginning of the meeting. For agenda items that have already gone out for public hearing and/or have had a public comment period that has closed, the Board Chair may determine that additional public comment will not provide additional information. In this circumstance the Chair will not allow additional public comment on an issue. For agenda items that the public has not had a chance to provide input, the Board Chair may allow limited opportunity for comment. The Board Chair has the discretion to limit the number of speakers and/or the length of each comment.

4. Consider Draft Addendum VIII on Implementation of Recommended Changes from 2021 ARM Revision and Peer Review Report for Final Approval (9:15-10:30 a.m.) Final Action

Background

- In October 2019, the Board directed the Adaptive Resource Management (ARM) Subcommittee to begin working on updates to the ARM Framework to revisit several aspects of the ARM model to incorporate horseshoe crab population estimates from the Catch Multiple Survey Analysis (CMSA) model used in the 2019 Benchmark Stock Assessment and the most current scientific information available for horseshoe crabs and red knots.
- In January 2022, the Board accepted the ARM Revision and Peer Review for management use, and initiated a Draft Addendum to consider allowing its use in setting annual specifications for horseshoe crabs of Delaware Bay-origin. The draft addendum document was approved for public comment in August 2022 (**Briefing Materials**).
- Draft Addendum VIII includes two proposed management options: A) No Action, and B) Implement the ARM Revision for setting bait harvest specifications for Delaware Bay-origin horseshoe crabs. Option A would result in the management program reverting back to the

provisions of Addendum VI, including static state quotas for NJ, DE, MD and VA along with seasonal closures and other restrictions to the fishery. Option B would result in continued adaptive management using the Revised ARM Framework, in which annual specifications would be set according to harvest recommendations from the ARM based on abundance levels of horseshoe crabs and shorebirds.

- During the comment period four public hearings were held, and over 34,000 written comments were submitted by individuals and organizations (**Briefing Materials**).

Presentations

- Review of Draft Addendum VIII and Summary of Public Comments by C. Starks

Board actions for consideration at this meeting

- Select management options and approve Draft Addendum VIII

5. Set 2023 Delaware Bay Harvest Specifications (10:30-11:10 a.m.) Final Action

Background

- In October 2022, the Delaware Bay Ecosystem TC (DBETC) and Adaptive Resource Management (ARM) Subcommittee met to review results of 2020-2021 horseshoe crab and red knot population abundance surveys in the Delaware Bay region (**Briefing Materials**).
- The ARM Subcommittee used population estimates from the Virginia Tech Trawl Survey in 2021 to estimate horseshoe crab abundance in the Delaware Bay region. A report was also provided on the red knot stopover population estimate for 2022 (**Briefing Materials**).
- The ARM model was run using estimated abundances of horseshoe crabs in fall of 2021 and red knots in spring of 2022 to provide a recommendation for harvest specifications for Delaware Bay states in 2023. Both the original ARM and the 2021 Revision were used to generate optimal harvest outputs for comparison by the committees. The committees recommended using the 2021 ARM Revision results for setting 2023 specifications (**Briefing Materials**).

Presentations

- Horseshoe Crab and Red Knot Abundance Estimates and 2022 ARM Model Results by J. Sweka

Board actions for consideration at this meeting

- Consider ARM harvest recommendations and set 2023 specifications for states in the Delaware Bay region.

6. Review and Populate Work Group to Review Best Management Practices for Handling Biomedical Collections (11:10-11:20 a.m.) Action

Background

- In October 2021, The Board tasked the Plan Development Team to review biomedical mortality, discuss biologically-based options for setting the threshold, and consider updates to best management practices (BMPs) for handling biomedical collections.
- In August 2022, after considering recommendations from the PDT, TC, and Advisory Panel (AP) the Board agreed to take no action on the biomedical mortality, noting that biomedical mortality contributes a relatively small amount of overall mortality, to continue to annually review estimated biomedical mortality levels, and also to form a Work Group to address the biomedical BMPs.

- The Board submitted nominations for members to serve on the Work Group following the August 2022 meeting.

Presentations

- Nominations to the Work Group by C. Starks

Board actions for consideration at this meeting

- Approve Work Group membership

7. Consider Fishery Management Plan Review and State Compliance for the 2021 Fishing Year (11:20-11:30 a.m.) Action

Background

- State Compliance Reports were due July 1, 2021.
- The Plan Review Team reviewed each state report and compiled the annual FMP Review (**Briefing Materials**).
- South Carolina, Georgia, and Florida have requested and meet the requirements of *de minimis* status.

Presentations

- FMP Review of the 2021 Fishing Year by C. Starks

Board actions for consideration at this meeting

- Accept FMP Review and State Compliance Reports for the 2021 Fishing Year.
- Approve *de minimis* requests.

8. Other Business/Adjourn

Horseshoe Crab

Activity level: Medium

Committee Overlap Score: Low (SAS overlaps with BERP)

Committee Task List

- PDT – Development of Draft Addendum VIII to consider use of the ARM Revision in setting Delaware Bay harvest specifications
- PDT – review the threshold for biomedical use to develop biological based options for the threshold and to develop options for action when the threshold is exceeded; review best management practices for handling biomedical catch and suggest options for updating and implementing best management practices (BMPs).
- TC – July 1st: Annual compliance reports due
- ARM & DBETC – Fall: Annual ARM model to set Delaware Bay specifications, review red knot and VT trawl survey results

TC Members: Natalie Ameral (RI, Chair), Jeff Brunson (SC), Derek Perry (MA), Deb Pacileo (CT), Catherine Ziegler (NY), Samantha Macquesten (NJ), Jordan Zimmerman (DE), Steve Doctor (MD), Ingrid Braun (PRFC), Adam Kenyon (VA), Jeffrey Dobbs (NC), Eddie Leonard (GA), Claire Crowley (FL), Chris Wright (NMFS), Joanna Burger (Rutgers), Mike Millard (USFWS), Kristen Anstead (ASMFC), Caitlin Starks (ASMFC)

Delaware Bay Ecosystem TC Members: Wendy Walsh (USFWS, Chair), Samantha MacQuesten (NJ), Henrietta Bellman (DE, Vice Chair), Jordan Zimmerman (DE), Steve Doctor (MD), Adam Kenyon (VA), Jim Fraser (VA Tech), Eric Hallerman (VA Tech), Mike Millard (USFWS), Kristen Anstead (ASMFC), Caitlin Starks (ASMFC)

ARM Subcommittee Members: John Sweka (USFWS, Chair), Linda Barry (NJ), Henrietta Bellman (DE), Jason Boucher (DE), Steve Doctor (MD), Wendy Walsh (USFWS), Conor McGowan (USGS/Auburn), David Smith (USGS), Jim Lyons (USGS, ARM Vice Chair), Jim Nichols (USGS), Kristen Anstead (ASMFC), Caitlin Starks (ASMFC)

Draft Proceedings of the Horseshoe Crab Management Board
August 2022

**DRAFT PROCEEDINGS OF THE
ATLANTIC STATES MARINE FISHERIES COMMISSION
HORSESHOE CRAB MANAGEMENT BOARD**

**The Westin Crystal City
Arlington, Virginia**

August 3, 2022

These minutes are draft and subject to approval by the Horseshoe Crab Management Board.
The Board will review the minutes during its next meeting.

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2. **Move to approve Proceedings of May 3, 2022** by Consent (Page 1).
3. **Move to approve Draft Addendum VIII for public comment** (Page 7). Motion by Roy Miller; second by Mike Luisi. Motion carried (15 in favor) (Page 17).
4. **Move to approve Horseshoe Crab Advisory Panel nominations for David Meservey from Massachusetts, and Jordan Giuttari and Matt Sarver from Delaware** (Page 23). Motion by Dan McKiernan; second by Emerson Hasbrouck. Motion approved by consent (Page 23).
5. **Move to elect Dr. Justin Davis of Connecticut as Vice-chair of the Horseshoe Crab Management Board** (Page 23). Motion by Joe Cimino; second by Jim Gilmore. Motion approved by consent (Page 23).
6. **Motion to adjourn** by Consent (Page 23).

ATTENDANCE

Board Members

Dan McKiernan, MA (AA)	Mike Luisi, MD, Administrative proxy
Raymond Kane, MA (GA)	Russell Dize, MD (GA)
Sarah Ferrara, MA, proxy for Rep. Peake (LA)	Pat Geer, VA, proxy for J. Green (AA)
Conor McManus, RI, proxy for J. McNamee (AA)	Bryan Plumlee, VA (GA)
David Borden, RI (GA)	Chris Batsavage, NC, proxy for K. Rawls (AA)
Eric Reid, RI, proxy for Sen. Sosnowski (LA)	Jerry Mannen, NC (GA)
Justin Davis, CT (AA)	Mel Bell, SC (AA)
Bill Hyatt, CT (GA)	Malcolm Rhodes, SC (GA)
Sen. Craig Miner, CT (LA)	Chris McDonough, SC, proxy for Sen. Cromer (LA)
Jim Gilmore, NY (AA)	Doug Haymans, GA (AA)
Emerson Hasbrouck, NY (GA)	Spud Woodward, GA (GA)
Joe Cimino, NJ (AA)	Erika Burgess, FL, proxy for J. McCawley (AA)
Tom Fote, NJ (GA)	Gary Jennings, FL (GA)
Peter Clarke, NJ, proxy for T. Fote (GA)	Marty Gary, PRFC
John Clark, DE (AA)	Chris Wright, NMFS
Roy Miller, DE (GA)	Rick Jacobson, US FWS

(AA = Administrative Appointee; GA = Governor Appointee; LA = Legislative Appointee)

Ex-Officio Members

Natalie Ameral, Technical Committee Chair	Nick Couch, Law Enforcement Representative
Brett Hoffmeister, Advisory Panel Chair	

Staff

Robert Beal	Kristen Anstead	Adam Lee
Toni Kerns	Lindsey Aubart	Sarah Murray
Maya Drzewicki	Lisa Havel	Heather Power
Tina Berger	Chris Jacobs	Caitlin Starks
Pat Campfield	Jeff Kipp	

Guests

Pat Augustine, Coram, NY	Diane Bynum	Jacob Espittia, FL FWC
Linda Barry, NJ DEP	Nicole Caudell, MD DNR	Sheila Eyler, US FWS
Rachel Barrales, Cape Cod CFA	Mike Celestino, NJ DEP	Catherine Fede, NYS DEC
Meredith Bartron, US FWS	Laura Chamberlin	James Fletcher
Henrietta Bellman, DE DFW	Kristin Comolli, DE DFW	Angela Giuliano, MD DNR
Ruth Bergstrom	Margaret Conroy, DE DFW	Dave Grant
Alan Bianchi, NC DENR	Heather Corbett, NJ DEP	Ellie Gruber
Nora Blair, Charles River Labs	Deborah Cramer	Helen Takade-Heumacher, EDF
John Bloomfield	Claire Crowley, FL FWC	Harry Hornick, MD DNR
Jeff Brust, NJ DEP	Tim Dillingham, Littoral Society	Jessie Hornstein, NYS DEC

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Guests (continued)

Lani Hummel	Kirby Rootes-Murdy USGS	John Sweka, US FWS
Christian Hunt	Josh Newhard, US FWS	Toni Rose Tablante, Littoral Society
Aidan Kaiser-Bulmash	Thomas Newman	Joseph Tricarico
Adam Kenyon, VMRC	Tamara O'Connell, MD DNR	Corinne Truesdale, RI DEM
Karen Knotts, USGA	George O'Donnell, MD DNR	Christina Vaeth
Rob LaFrance, Quinnipiac Univ	Joanne Pannone	Carly Valco
Lynn Lankshear, NOAA	Derek Perry, MA DMF	Scott Curatolo Wagemann, Cornell
Christina Lecker, Fuji Film	Jessica Ponder, PCRMC	Mike Waine, ASA
Benjamin Levitan, EarthJustice	Jill Ramsey, VMRC	Wendy Walsh, US FWS
Tom Lilly	Kathy Rawls, NC (AA)	Ritchie White, NH (GA)
Susan Linder	Harry Rickabaugh, MD DNR	Quinn Whitesall, Littoral Society
Olivia Liu	Karla Rossini	Kelly Whitmore, MA DMF
Loren Lustig, PA (GA)	Mike Ruccio, NOAA	Kristoffer Whitney, RIT
Samantha MacQuesten, NJ DEP	Dan Ryan, DC	Meredith Whitten, NC DENR
Shanna Madsen, VMRC	Matthew Sarver	Chris Wright, NOAA
Jennifer Malpass, US Geo. Survey	Amy Schueller, NMFS	Jennifer Zarcone
John Maniscalco, NYS DEC	Chris Scott, NYS DEC	Faith Zerbe, DE Riverkeeper
Cathy McConnell, OptOnline	Ross Self, SC DNR	Erik Zlokovitz, MD DNR
Kim McKown, NYS DEC	Jeff Shenot, NOAA	Renee Zobel, NH F&G
Nichola Meserve, MA DMF	Ethan Simpson, VMRC	
David Meservey, Chatham, MA	Somers Smott, VMRC	
Steve Meyers	Renee St. Amand, CT DEP	
Mike Millard	David Stormer, DE DFW	

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The Horseshoe Crab Management Board of the Atlantic States Marine Fisheries Commission convened in the Jefferson Ballroom of the Westin Crystal City Hotel, Arlington, Virginia, via hybrid meeting, in-person and webinar; Wednesday, August 3, 2022, and was called to order at 10:15 a.m. by Chair John Clark.

CALL TO ORDER

CHAIR JOHN CLARK: Welcome, everybody. This is the call to order for the Horseshoe Crab Management Board. I'm John Clark, I'm the Administrative Commissioner from the fabulous first state, and I will be chairing this meeting.

APPROVAL OF AGENDA

CHAIR CLARK: We will now move on to our Board consent items. Does anybody have any changes to the agenda?

I do not see any, so we will consider that approved by consent.

APPROVAL OF PROCEEDINGS

CHAIR CLARK: Everybody has had a chance to look at the proceedings from the May, 2022 meeting, does anybody have any revisions to the proceedings? Not seeing any; those are approved by consent.

PUBLIC COMMENT

CHAIR CLARK: We'll move on to the next item, Public Comment, and this is public comment for items that are not on the agenda.

We know there is a lot of interest in the next agenda item, and when we discuss that we will take public comment on that item. But right now, this is public comment on items that are not on the agenda.

CONSIDER DRAFT ADDENDUM VII ON THE IMPLEMENTATION OF RECOMMENDED CHANGES FROM THE 2021 ADAPTIVE RESOURCE MANAGEMENT REVISION AND PEER REVIEW REPORT FOR PUBLIC COMMENT

CHAIR CLARK: I don't see any hands, we don't have any sign ups, so now we'll move on to the next item. That is to consider Draft Addendum VII on the implementation of recommended changes from the 2021 Adaptive Resource Management Revision and Peer Review Report for Public Comment.

As you know, we approved the ARM for management use at the January Board meeting, and we approved starting the Draft Addendum at the May meeting, and so now Caitlin is going to bring us up to speed as to where we are now and where we will be going next. Thank you, take it away, Caitlin.

MS. CAITLIN STARKS: Thanks, John did a quick summary of where we are, but for the presentation today I'm just going to cover some of that background leading up to this meeting, and then review the recommended changes to the ARM that are being considered in the Addendum.

The proposed action timeline, the proposed management options, and then finally wrap up with the Board action for consideration and next steps. Just as a refresher, on the current management process, Addendum VII to the Horseshoe Crab FMP established the Adaptive Resource Management or ARM Framework for recommending bait harvest quotas for the Delaware Bay Region, and under Addendum VII the ARM annually recommends a bait harvest package, which is based on the abundance of both horseshoe crab and red knot. As you all know, this ARM went through a revision process and peer review process, which the Board accepted in January, 2022. Through that process the ARM was updated to address some of the peer review critiques that were made about the original ARM framework.

It includes new data sources to improve the models, and also adopt a new modeling software to replace the previously used program, which is now obsolete

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and can no longer be used to run the ARM model. At that January meeting, the Board also initiated Draft Addendum VIII to consider using the revised ARM to set the annual specifications for horseshoe crabs of Delaware Bay origin, which is what the Board is discussing today.

This slide shows the conceptual model of the ARM framework, which I just wanted to briefly show to remind everyone how it works. You can see the ARM involved the population models for both horseshoe crabs and for red knots, which incorporates survey data for both species.

In the ARM revision, the major changes that were made to the whole framework were improvements to the horseshoe crab population dynamics model, and the red knot population dynamics model, revised reward function that relates those two, and the transition to the new software, as well as harvest recommendations on a continuous scale, rather than discreet harvest packages, and the model can now be more easily updated with new data.

I want to note here that through that review process the conceptual model of horseshoe crab abundance influencing red knot survival and reproduction has been maintained, to ensure that the abundance of horseshoe crabs does not become a limiting factor for the population growth of red knots.

This is our current timeline for Draft Addendum VIII. The Board initiated the Addendum in January, and since then the PDT or Plan Development Team has met a number of times and developed the Draft Addendum document before you today. Today the Board will consider Draft Addendum VIII for public comment. If it is approved today, the public comment period could occur in September or late August through September, and the Board could meet again in November, 2022 to consider final action on the Addendum.

Within the Draft Addendum we have two main options. Option A would be a no action option, and Option B would be to use the revised ARM for

management, to set bait harvest specifications for the Delaware Bay. For Option A, we used the no action option, because true status quo is no longer an option, due to the fact that the previous ARM model and the software that was used for it is now outdated, and it cannot be updated.

This means it is no longer adaptive resource management. Option B would incorporate all of the changes that were recommended in the 2021 ARM Revision and in the peer review, in terms of the data and model updates. But the general structure of how the ARM optimal harvest recommendation is allocated among the four Delaware Bay states would essentially be the same. I'll go over exactly what the proposed changes are in a few slides. Under Option A, if we take no action the management would revert back to the provisions of Addendum VI, and this means the quotas for the four states of New Jersey through Virginia would go back to what is shown in this table. In addition to those quotas, Addendum VI prohibits directed harvest and landing of all horseshoe crabs in New Jersey and Delaware from January 1, through June 7, and it prohibits female horseshoe crab harvest in New Jersey and Delaware for the remainder of the year from June 8 to December 31.

It also prohibits the landing of horseshoe crabs in Virginia from federal waters from January 1 through June 7, and it mandates that no more than 40 percent of Virginia's annual quota may be harvested east of the COLREGS line in ocean waters, and it also requires that horseshoe crabs harvested east of the COLREGS line and landed in Virginia must be comprised of a minimum male to female ration of 2 to 1.

Alternatively, Option B would adopt the changes recommended in the 2021 ARM revision, and going forward the revised ARM would be used for recommending and setting the bait harvest specifications for Delaware Bay origin horseshoe crab. Option B addresses each of the aspects that were established in Addendum 7, related to how harvest specifications are set.

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This includes the harvest recommendations that come out of the ARM. The adaptive management cycle, the percent harvest of Delaware Bay origin crab for each state, and then the state allocations and fallback options. I'm going to walk through each of these one by one, and review what's proposed in Draft Addendum VIII.

First on the issue of harvest recommendations, the Addendum proposes that the revised ARM be used to annually recommend the optimal harvest levels for males and females. I want to note that the maximum number of males and females that the ARM can recommend is the same as before at 500,000 males and 210,000 females.

However, where the original ARM recommended 1 of 5 discreet harvest packages of males and females, the revised ARM recommends sex-specific harvest levels on a continuous scale. That means that the optimal harvest recommendation for males and females could be any number from 0 to the maximum amount of males and females.

For this issue there are two sub-options that would take that optimal harvest output from the ARM for each sex, and round it down to the nearest 25 or 50,000 crabs. Rounding the harvest recommendation to some degree is necessary, because Delaware Bay specific biomedical data, which is confidential, would be fed into the model.

Rounding that output would prevent anyone from being able to back calculate the biomedical mortality input data. Sub-Option B1 would generally result in a harvest recommendation that is closer to the optimal harvest, and Sub-Option B2 would generally result in a more conservative harvest recommendation.

But one clarification here to add is that if the ARM does recommend the maximum amount for either males or females, rounding would not be necessary to protect the confidential data, because in that case you're already doing that by limiting it to the maximum. This table shows what the harvest recommendations for 2017 through 2019 would have been if they had been produced with the

revised ARM. As a note, in these examples the CMSA or Catch Multiple Survey Model uses the coastwide biomedical mortality data, rather than Delaware Bay specific data. This means these numbers are slightly overestimated from what would come out of the model if we used the Delaware Bay specific biomedical data.

As you can see here, each of these years the ARM recommends a maximum amount of male harvest and a varying amount of female harvest around 150,000 crabs. Using the 2019 optimal harvest recommendation from the last slide, which are shown again in the uppermost table here. The lower two tables below that show what each of the two sub-options for rounding would produce for the final harvest recommendation.

Under B1 the optimal harvest of 144,803 crabs gets rounded down to 125,000 crabs, and under B2 the female harvest gets rounded down to 100,000 crabs. As I noted before, the male harvest does not get rounded down, because it's already being capped at 500,000, and so the biomedical mortality data could not be back calculated.

This is the second item under Option B and it is the management process for using the ARM framework, so it's slightly modified from the text in Addendum VII to more clearly describe each of the steps of the short- and long-term management process in ARM revision process. Under the Option B there is a three-level process that would be adopted, including an annual management process, an interim update process, and a revision process.

The annual management process is basically the same as the annual cycle described in Addendum VII, which is what we use now, where the ARM framework is used to produce harvest recommendations for the upcoming fishing year. The interim update process is a new addition, and that is that every three years the model parameters, including things like red knot survival and recruitment and horseshoe crab stock recruitment relationships would be updated based on the most recent years of data that are routinely collected for the region.

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Then the third level is a more intensive revision process that would occur every 9 or 10 years, or sooner if desired by the Board, in which the ARM framework would undergo a revision process similar to what occurred for the 2021 ARM revision. This 9-to-10-year timeline was selected, because it allows for two interim updates to occur, and it also encompasses a generation for horseshoe crab.

Our third issue is the proportion of harvest that is of Delaware Bay origin for each state, and this value is called Lambda. As the 2021 revision recommends, Option B would update the Lambda values for each state based on more recent genetic data, and this would result in decreases to the proportion of Maryland and Virginia's harvest that is assumed to be of Delaware Bay origin, and Delaware and New Jersey's proportions would remain unchanged.

As you'll see shortly, these Lambda values do affect the state-by-state allocations of the overall Delaware Bay quota. This is a comparison of the current Lambda values that are used in the original ARM in Addendum VII, with the proposed updated Lambda values. The fourth issue is the methodology for calculating the state allocations of the total Delaware Bay harvest. Under Option B in Draft Addendum VIII, the only change to the allocation methodology from Addendum VII is that those updated Lambda values would be used, which results in new allocation weights for each state. With this change the new state allocations of the Delaware Bay harvest limit would be shown in the top table, and with the change the allocations for New Jersey and Delaware slightly increased, and the allocations for Maryland and Virginia slightly decrease.

The other two aspects of the state allocations, which are the harvest cap provision and the 2:1 male/female offset provision would remain status quo from Addendum VII under option B. Just to describe what those are, the harvest cap for Maryland and Virginia limits the total level of allowed harvest by those two states, in order to provide some protection to crabs that are not of Delaware Bay origin.

The caps are shown in the bottom table, and those were based on Addendum VI quota levels for Maryland and Virginia. These caps do not apply when the ARM framework outputs and optimized harvest output prohibits female harvest of horseshoe crab. As a result, to date these harvest caps have not come into play, because since the original ARM was implemented, it has not recommended female harvest.

The two-to-one offset is relevant when the ARM recommends zero female crab harvest for the Delaware Bay. When that recommended female harvest is zero, this provision allows a two-to-one offset of males to females, which means the total male harvest allocation of Maryland and Virginia is increased at a two-to-one ratio, and it's allowed to rise above the cap level.

Again here, we're only talking about Virginia's quota for crabs east of the COLREGS line, for clarity. These are the state allocations under Addendum VII, compared with the proposed allocations under Addendum VIII. This is as an example to show you if the total harvest quota for Delaware Bay that comes out of the ARM is 500,000 males and 100,000 females.

The breakdown among the four states would look like this. This is just the Delaware Bay portion of the state's quotas, not their total quotas when you add in non-Delaware Bay origin crab. I'm going to go to the next slide and show you, on this slide you can see both the Delaware Bay origin quotas, which are on the left in blue, and the total quotas on the right in orange. These totals include the non-Delaware Bay origin crabs. You can see for each of the states, using the revised allocation.

Delaware and New Jersey are the same on both sides, because 100 percent of their harvest is considered Delaware Bay origin crab, while Maryland and Virginia's overall quotas, which are in red, are greater than their Delaware Bay only quotas to account for those additional crabs in their harvest that are not of Delaware Bay origin. I also want to note in this example that the harvest cap

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for Maryland and Virginia are being applied, because there is female harvest recommended in this example.

The other thing I want to note is that Maryland and Virginia's overall quotas end up being the same as what was in Addendum IV and VI, and the quota for Virginia shown here is just the quota for east of the COLREGS line. The last item in Option B is the fallback option for if the ARM cannot provide a harvest recommendation in a given year. Option B includes the same fallback options as Addendum VII, which is that if in a given year there is not enough data, if a model cannot produce a harvest recommendation, the next year's harvest may be set either based on Addendum VI quotas and management measures for New Jersey, Delaware, Maryland and Virginia coastal waters, or it can be based on the previous year's ARM framework harvest level and allocation for the four states.

Beyond that language the section is just updated to reflect the new datasets that are required for running the revised ARM model, but this is essentially the same as Addendum VII. This is the tentative timeline for the next steps for Draft Addendum VIII. Today again, the Board will consider the document for public comment.

If it's approved today public hearings could be held in September, and the Board could consider the Addendum for final approval at the annual meeting in November this year. With that the two things the Board could choose to do today are to specify any desired changes to the document before releasing it for public comment, and to consider approval of the Addendum for public comment. That's my last slide, I'm happy to take any questions.

CHAIR CLARK: Thank you, Caitlin. If we have questions at this point, and I was remiss before, I wanted to point out that also up here we have Kristen Anstead, who led the ARM development process here, which has been phenomenal. We also have Brett Hoffmeister, who is head of the Advisory Panel for Horseshoe Crab. Does anybody have any questions for Caitlin about the Addendum? Yes, Justin.

DR. JUSTIN DAVIS: I'm hoping Commission staff might be able to speak to the letter that was received from Earth Justice, with the records request, because it seems like that is something we should discuss, as part of this discussion of whether to send the Addendum out for public comment at this point.

As I understood that letter, it was referencing a records request to the Commission and to USGS and U.S. Fish and Wildlife Service, and also asking that this body delay sending the Addendum out for public comment until that records request is met, and the information could be considered. I'm just wondering if Commission staff could speak to how the Commission responded or plans to respond to that request.

You know issues around data confidentiality, that might be relative to that request, and also kind of considerations for what meeting this request or not meeting it, or meeting it partially could mean for sort of the future of the science program that we're conducting here for this species, or even assessments for other species. That's a whole host of stuff, but I'm just kind of hoping someone can speak to that.

CHAIR CLARK: Somebody else is up here that can answer these questions, and it's Toni Kerns, so Toni, do you want to take that?

MS. TONI KERNS: Thank you for the question, Justin. The Commission did receive an information request. It was the first request after we posted our new policy on information requests from Earth Justice. We responded back to Earth Justice on all parts of the information they requested, either with the data or where to reach out to receive the data. What the Commission did provide was information that we own, I guess you would call it, or information that the Commission created in-house. For the models that use the ARM, I would call it that we have three main models for that.

The CMSA model, which is what we use to assess the population, is the model that the Commission owns, so we did provide that to the requesters, as

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well as, Kristen will inform me if I say this wrong, but the data that was used in the run itself. If you use the raw data, some of that raw data could be confidential, or it's not proprietary to the Commission, because we did not collect that data. We pointed out to them on raw datasets that are used in that, and who it was at the state or federal agency or university that they could make that request to them from. The other two models are not property of the Commission, and they are for USGS, and so we sent them to USGS for that information.

USGS is responding to a very similar FOIA request for them, as well as U.S. Fish and Wildlife Service. In terms of if all of the models were provided to the requesters. As I said before, there are confidential data sources in these models, so the requesters would not be able to receive that confidential information, so they would not be able to replicate the exact runs that the ARM Subcommittee did use because of that.

I will also just point out that in terms of transparency, that question was asked of us earlier at the Executive Committee. The Commission did send out a press release notifying that the ARM Peer Review would be happening. That peer review was open to the public. It was posted on the calendar as well, and anybody that wanted to follow along on how the ARM worked, minority reports that were asked of the Committee, could have done so.

There is public comment during those peer reviews. We went back and looked, and we did not have very many of the public in attendance for those that are asking these questions of the Commission at this time. I'm trying to make sure I'm hitting on all the points that you raised. Am I missing anything that you were hoping to receive, Justin?

CHAIR CLARK: Want to follow up, Justin?

DR. DAVIS: No, I think that pretty much covers it, and I guess to summarize. It would be fair to say that at this point the Commission has released any information that is proprietary to the Commission,

non-confidential that we can release, including some models, so that the models even without the source data. Somebody could look at the modeling code and see how the models work, and that we directed the requester for those sources of information we couldn't provide to where they could go request that information from outside the Commission.

MS. KERNS: John, one more piece.

CHAIR CLARK: Sure thing, Toni.

MS. KERNS: I'll just note that some of the questions that are being raised on the different, I guess data information that there are discrepancies on. Some of that was brought up in these minority reports. The Peer Review looked at those, addressed them, sensitivity analyses were done on those.

That's all in the Peer Review Report, which is posted to the Commission's web page, and those questions could be asked of Committee members as well if people wanted to have more information on this. But we haven't received any specific questions about those minority reports or the Peer Review's review of them.

CHAIR CLARK: Thank you for that question, Justin, and thank you for the very thorough answer, Toni. It's good to get that on the record. Are there other questions about the Addendum itself from the Board? Is there anybody online? Okay, at this point if we have a question from the audience there, if you would like to come up to the public microphone.

DR. JON HARE: Thank you very much, Jon Hare, NOAA Fisheries. Toni, thank you for describing the Peer Review process for the Horseshoe Crab model. Is that sort of the standard process that ASMFC follows for all of its assessments and advice?

MS. KERNS: That is correct, Jon.

DR. HARE: Thank you very much, may I comment, Mr. Chair?

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CHAIR CLARK: Sure thing, Jon, I'm sorry I didn't recognize you. My eyes aren't what they used to be.

DR. HARE: My eyes aren't good either.

CHAIR CLARK: Go right ahead.

DR. HARE: Again, there has been a thorough Peer Review process, which is how we have defined evaluating science to use in our management decisions, and if that process needs to be revisited, the Science Center is happy to work with ASMFC on revisiting processes and helping where we can. Listening to Toni describe, it sounds like your Peer Review and scientific process has been followed. There are opportunities to bring new science into that process, so I just encourage you to think about supporting the processes that you have in place.

CHAIR CLARK: Thank you, Jon. Is that all we have in terms of questions at this point? All right, I would say to the Board, maybe the next step could be that we get a motion up here about this Addendum, and then we can have a discussion amongst the Board, and also then take comments from the public at this point. Is anybody ready to offer a motion? I see Roy Miller.

MR. ROY W. MILLER: Hopefully staff has this motion prepared. That's the quick and dirty version. Just for clarification purposes, let me say what that entails. It would be: Move to approve Draft Addendum VIII on the implementation of recommended changes for the 2021 Adaptive Resource Management Revision and Peer Review Report for public comment, which has been whittled down to read: **Move to approve Draft Addendum VIII for public comment**, as modified today. I don't know as we modified it today.

MS. STARKS: Correct. Maya, could you please remove "as modified today" thank you.

CHAIR CLARK: Do we have a second? Mike Luisi. Now let's have discussion on that. Roy, would you like to start the discussion, since you made the motion?

MR. MILLER: I would like to put on record that by approving this Draft Addendum VIII for public comment, it is not approving specific harvest levels that are contained in Addendum VII. That becomes a Board decision at future meetings. In other words, by approving this Addendum, it is not saying necessarily that the Delaware Bay jurisdictions will approve a female harvest scenario. That is yet to be determined.

This is a framework for how we can manage this species in the future, but it will be annual decision making involved. I just wanted to state that. But I think if we're going to hang our hat on the ARM model, which we have for many years now, this is an upgrade that needs to happen. The original ARM model is no longer appropriate, it's outmoded, and this is the right thing to do, because it's the best available science for us in managing horseshoe crabs.

CHAIR CLARK: Thank you, Roy, and Mike, did you have anything to add as the seconder?

MR. MICHAEL LUISI: What Roy said. Thanks.

CHAIR CLARK: Anybody else have any comments they would like to make about the motion? Okay, I see Bill, Justin, and Joe and go ahead, Bill.

MR. WILLIAM HYATT: Just a quick question, and I think it's largely a follow up to the question that Justin had asked earlier, and that Toni had responded to. That is obviously there are FOIA requests that are being filed elsewhere for information that the Commission does not have control over. I think some of the people that are reaching out to us and others would ask, is there benefit in waiting until those FOIA requests are addressed elsewhere before taking this first step? I'm not advocating for that. But I feel that the question needs to be asked.

CHAIR CLARK: Would you like to respond to that? Bob. Thank you.

EXECUTIVE DIRECTOR ROBERT E. BEAL: I don't think I have much to add, Bill, beyond what Toni said

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earlier. I think our Peer Review Process was followed, and it's an open and transparent process, and the public was able to participate throughout that process. We at ASMFC have responded as well as we can, with all the information we do have that is non-confidential to the folks that asked for information from us.

You know I think the difficult part is, at the end of the day you know some of the requesters of this information want to recreate the model. They want to be able to rerun the model, tweak the model, and recreate the output that went through Peer Review. The difficult part there is going to be that recreating the exact runs that the Technical Committee, Stock Assessment Committee, and Peer Reviewers looked at. You can't do that unless you have access to all the confidential data. Someone could rerun that model if they had the software package, which is pretty complicated to do that. But they could probably get kind of close by making assumptions about confidential data, and lumping together that confidential data and other things.

But they won't be able to recreate the total runs, because of the data confidentiality laws at the state and federal level. I guess where I'm going is I'm not sure how much additional information the public will have at the end of the day, once all those FOIA requests at the federal level are fulfilled.

I don't think the requesters will be able to completely rerun the model and do exactly what the technical folks have done, just because of confidential data. I don't like giving that answer, because you know I wish everyone could access all the data, we could see everything and it was an open book.

But the confidentiality laws are what they are, and we can't share those things, so those are the laws. I don't know, I guess the question is what additional information would be available, and how much better would the public be able to comment? They won't be able to recreate everything that has taken place up to now.

CHAIR CLARK: Do you want to follow up, Bill?

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MR. HYATT: Yes, thank you, Bob, I appreciate that response. I just want to mention that I also appreciate the point that Roy made earlier that this model is providing recommendations, and that the Board is not obligated to determine and set harvest levels at the numbers that are kicked out by the model, if it ultimately does get approved and put into practice.

CHAIR CLARK: Next I have Justin Davis.

DR. DAVIS: My question is, what would be the implications of delaying sending the Draft Addendum out for public comment at this point, you know perhaps indefinitely until all the records request were satisfied? You know what would be the implications for management next year of the horseshoe crab fishery?

MS. KERNS: As you all know, we can no longer run the old ARM model, so we would not be able to do the interactions with current information. The only thing that we would be able to do is Addendum VII allows us to, in the event that you can't run the arm, you can just use the previous year's package, or the Board can default back to the Addendum VI quotas, and that is pre-ARM, so it takes no consideration how horseshoe crab and red knot interact.

CHAIR CLARK: All right, thanks, next question is from Joe Cimino.

MR. JOE CIMINO: Yes, not really a question, just a discussion on the motion, Mr. Chair. You know since we did have the minority report, and the authors of those were given the opportunity to be at the Peer Review and give their responses. I think that that added level of exchange is important. I think really the public has a great deal of information to go back through the Peer Review and the responses to the minority reports. That is available prior to this document coming out, and their chance to go through the public comments. I think one of the interesting things that came out of the peer review was not really a concern for the model.

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But just where the ARM model is trying to bring management, or co-management for these species, was talked about by the Peer Reviewers, with suggestions that maybe there is a next step to come. One of the suggestions I believe was to consider management strategy evaluation. I think through this public process that might be part of the discussion that you have done well. I fully support the motion.

CHAIR CLARK: Next we have Mike Luisi, then we have a couple from online.

MR. LUISI: I said it before. I fully support the rationale that Roy gave, in continuing to develop Draft Addendum VIII, and moving this forward to the public. I certainly understand the concern about this request for information. I support third party requests for information to try to understand more fully the work that is being done and presented to the Board. My concern about delaying as a result of a third-party request for information is that it could set up a precedent down the road for whenever a third party wants a delay.

They would ask for information that may or may not be available, to try to slow down the process that we're undertaking. I just don't like that idea that somebody could just asking for more information just to slow us down if we decide that we would pause here, and wait for something more to develop with that request. I support moving forward today, and will look forward to hearing from the public if that is approved.

CHAIR CLARK: Online we have Rick Jacobson of the Fish and Wildlife Service would like to make comment.

MR. RICK JACOBSON: Just for everyone else, my name is Rick Jacobson; I'm the Assistant Regional Director for Fisheries and Aquatic Conservation in the Northeast Region, and I'll be representing the Service on the Horseshoe Crab Management Board portion. We at the Service are committed to the duality of species recovery and sustainable use.

In that context we've been actively engaged in the acquisition and compilation of analysis and interpretation of best available science to guide our decision making, and fulfilling these dual roles. We've concluded that the ARM Revision is a manifestation of that best available science. The Service is aware of concerns from some stakeholders about the possibility of take under the ESA if the ARM Revision is adopted for management use.

With that we've conducted an analysis to evaluate the risk of take, and have determined that the risk of take of red knot under ESA is negligible. Thus, we're supportive of moving the Draft Addendum forward for public comment. The Service is also committed to transparency. To meet that commitment, we will make our analysis available to the public before or coincident with the start of the ARM Revision public comment period. Thank you.

CHAIR CLARK: Thank you, Rick, next up we have Chris Wright from NOAA Fisheries.

MR. CHRIS WRIGHT: Yes, I just wanted to say that we support moving forward with the current process, and going out to the public. I just wanted to, maybe we should clarify that the Peer Review Process was an independent process. You know the Peer Reviewers were independent.

In that I believe they also had access to that confidential data, so that I believe they did have that. If we can clarify that for the public, so that they know that those Peer Reviewers saw the whole thing. I think that might help. But we're in support. I think it is critical that we move forward with this, since we don't have the old model any more, and I think this helps more with the red knot situation and our ESA requirements on the federal side.

CHAIR CLARK: I'm going to turn it over to Kristen to answer your point about the Peer Review.

DR. KRISTEN ANSTEAD: For the 2019 benchmark, the full SAS and the Peer Review Panel all had access to confidential data. That's when the catch survey model was originally brought forward for a

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model for horseshoe crab, and fully reviewed gridding into that data. For the ARM revision we used the same model.

We used coastwide data to develop this full ARM model, so that we didn't have to deal with the confidential data at that scale. The Peer Review Panel actually didn't have access to the confidential data. They saw the run using coastwide data, they saw the output of models with confidential data, and determined that the sensitivity runs around that, it's didn't really move the needle all that much.

We're not talking about large numbers here. The Peer Review Panel actually didn't see the confidential data. That's not the only confidential data that is in question here. There is also tagging bird data that is confidential. It's not just biomedical that is a question mark here. Some of the inputs to the bird side of the models also is confidential.

CHAIR CLARK: Thank you, Kristen, and did that fulfill what you were looking for there, Chris?

MR. WRIGHT: Right, I just wanted to make sure that folks knew that throughout the whole process there was access to that data, especially initially in that, as Kristen mentioned, that there was a lot of scrutiny under this from both the federal side and from the public. There was a more than ample opportunity for folks and the Peer Reviewers to access and have a full review of the process.

CHAIR CLARK: Do we have any other comments from Commissioners, either at the table or in the virtual realm? Okay, we don't have any there. Before we call the question, is there anybody from the public then that wants to make comments? Just give us a second here. Okay, we have a comment from Tim Dillingham. Tim, please go right ahead.

MR. TIM DILLINGHAM: Tim Dillingham, and I'm the Executive Director for the American Littoral Society, based up in Highlands, New Jersey. We've been involved for a long time in the horseshoe crab and

shorebird recovery work. I want to thank the Board for their thoughtful discussion, and really identifying and raising some of the central questions. I guess we would like to raise two points, and asking you to delay this and to give it further consideration. I don't think anybody opposes the idea of updating the model so that it is functional and can be used, and making it as accurate as possible.

But I think in that technical work of updating the model, the new Addendum changes a fundamental policy that has been in place since 2009, when this conversation started. That is this idea of reserving or not providing utilities of female horseshoe crab take, until the crab populations and the red knot populations have recovered.

I think as far as the idea of whether or not the Peer Review process was sufficient in flagging these important issues. In the Peer Review report itself, it acknowledges. It says, because the changes would lead to the harvest of female horseshoe crabs, which have been restricted since the implementation of the original ARM framework.

The Panel cautions the Working Group to fully consider if the new reward function truly represents the values articulated by stakeholders in the 2009 ARM framework. I think that language that is in the Addendum, and the description of the, so the old model, about these thresholds, in terms of recovery of the knots and the crabs themselves before female harvest is provided for, is now being left behind.

I appreciate Mr. Miller's comments about, you know these are recommendations. But the public, and I think some of the stakeholders one, that question was not debated in a stakeholder process, so these are not one that sort of intricately involved a lot of people, which I think is why you have seen the reaction to it.

But I think it's also we're urging you to maintain that policy, not allow the harvest of females, particularly because of the eggs needed by the birds, and the fact we haven't recovered to the

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conservation thresholds that have been identified. I think that's a question that ought to be worked out before it goes out to the public, because it is a fundamental policy frame for your decision making, and we would urge you to retain that as you go forward.

On the transparency part of it, you know I think it's in transparency and whether information is sufficient, and whether people had access to it. It really seems to me that the stakeholders or the public should be the ones to decide whether or not they've had enough information. I understand the confidentiality laws, which are very problematic to me, in terms of the management of a public resource.

But I think you should take to heart the idea of the central stakeholder who is saying, we still have questions about the mechanics of this model, and we would like to examine them for ourselves to our own satisfaction. I appreciate your work, and thank you for the opportunity to provide comments.

CHAIR CLARK: Thank you, Tim. Joe, did you have something you want to follow up on those comments?

MR. CIMINO: Thanks, Mr. Chair, it's an indulgence as a former Chair. Perhaps Dr. Anstead could discuss how the old model would have allowed harvest, and it was knife edge. In fact, if a threshold was hit it would more or less be wide open after that. It's important, I think, to have a discussion on, and of course if this does go out for public comment that discussion can happen on the best way forward. But to talk about what the old model really allowed with that knife edge, and then perhaps why this is a potential improvement as an actual safety measure.

DR. ANSTEAD: Thank you, I'll do the best that I can with this. In the old model there were two thresholds, which you're probably familiar with. There was a horseshoe crab threshold and a red knot threshold, and if you got to one of those thresholds, either one, most likely the harvest

package selected would be the maximum amount of harvest.

In a scenario where horseshoe crabs from the Virginia Tech Trawl Survey hit that 11 million around their population number, you would automatically jump to 210 female harvest and slightly less than that for the males. There was some criticism during the Peer Review that these knife edge functions, so it's all of nothing, was not ideal, and also might not be adaptive management, because you are kind of putting on top of it what the answer should be, by saying you have to hit this level or this level.

That is not really adaptive management. That is sort of a harvest control rule. When we came to the revision, we did two different things. We changed the objective functions so that we would give credit to both red knots and both horseshoe crabs, before it was just credit for horseshoe crabs. You get a little bit of credit if your horseshoe crab populations are hitting some level.

That is not the maximum, it's kind of more of an S shape, so it kind of slowly ramps up to maximum harvest. The same with the birds. Instead of saying you get no credit for birds below the 81,000, it kind of slowly, when you're at the 40 you get just a tiny bit, and it slowly ramps up to that 81,000. In combination you get a little bit of credit if the horseshoe crabs are high, a little bit of credit if the birds are not below certain levels, and more credit as their populations increase.

Those two, kind of work together and that is why you get female harvest now. Those values are still in there, but they are not acting as thresholds. They are kind of acting as an ideal situation we would like to get to. But when the population specifically of horseshoe crabs is growing, you get a little bit more credit. It doesn't automatically jump to that 210, so we thought that that was a way to deal with it, address the Peer Review comments, and continue to use adaptive management to assess the species.

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CHAIR CLARK: Thank you for that explanation, Kristen. The next commenter we have from the public is Ben Levitan.

MR. BEN LEVITAN: Hi, thanks so much. This is Ben Levitan. I work at Earth Justice, and I submitted the FOIA requests and information request that you all were discussing. Those were submitted on behalf of New Jersey Audubon and Defenders of Wildlife. I really appreciate the discussion that you all had raising concerns about those FOIA requests, and I just thought that a little bit more context might help inform your consideration of this issue. We submitted requests for information to ASMFC, FWS, and USGS back in February, and as was mentioned, ASMFC did provide us with information about the CMSA model. However, that was only one of the four components of the model that ASMFC described as comprising the new ARM framework. The other three modeling components are all held by USGS. Just to give you an update on where that FOIA request stands.

Last week USGS officially denied the request for those models, pursuant to the deliberative process privilege. Those aren't even pending at this point. USGS has said that those are deliberative and cannot be released. The other thing that USGS informed us over e-mail is that they are actually hoping and intending to publish those models, but they are still undergoing fundamental science practices review within USGS, which is a necessary step before they can be published.

It seems like the review process at USGS is still ongoing for whether these models are even appropriate for public viewing at this point, and on top of that USGS is planning, apparently relatively soon, to release the models to the public. You know from that I would say two things. One, it seems like it would be a real move for transparency for the Board just to allow USGS to release the models on its own timeline, as it's planning to do, before opening the public comment period, so that the public is able to see the model that it's being asked to comment upon.

The other point that I would make, and you know I totally understand the concern that the public could submit records request just as sort of a manipulative technique to delay the process. That is really not where we are. We submitted these requests five months ago, more than five months ago. At this point it's not even about the timeline of our request.

We're just waiting on the federal agency USGS to release the models on its own timeline. The ball is in their court, it's not some strategy that we're using to try to delay this process. We just feel that the public needs to see what they're being asked to comment upon. It seems like the models will be released to the public fairly soon anyway, and that should just happen before the public comment period opens. Thank you.

CHAIR CLARK: Thank you for those comments, Ben, and I don't believe we have anybody from USGS online to address that. We have another hand from the Board, were there any other public comments? Okay, we don't have any other public comments, so Bill Hyatt.

MR. HYATT: Yes, John, I was going to ask the same question you just asked, if there was anybody available who might, from either USGS or who might be able to address some of the comments that were just made relative to timeline and review process, and what is actually happening within USGS. I do think that's valuable information to have.

CHAIR CLARK: Sure, agreed, and we do have one more commenter from the public that is Matthew Sarver. Go ahead, Matt.

MR. MATTHEW SARVER: Hey, thank you. Yes, I just wanted to just briefly echo many of the thoughts, comments that Tim made a few minutes ago around this. I do think it's important for the Board to remember that for a lot of the stakeholders, so first of all I'm the Conservation Chair of the Delaware and Ecological Society here in Delaware, it's all volunteer bird conservation organization. You know we're not all particularly well versed in

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the inner workings of ASMFC, and the various boards and processes and so forth. I personally, I mean I'm a professional ecologist.

I have a hard time sometimes finding information on these public comment periods, revisions, et cetera, even on the ASMFC website. I think that is important to keep in mind with thinking about the opportunity for stakeholder and public input into some of these changes. It's not particularly easy for a lot of folks from the public who aren't fisheries management professionals, to know where to find some of this information.

I think that is part of why a lot of folks in the bird conservation world are, you know perhaps weren't involved initially in some of the comment during the Peer Review process and so forth. I think part of that also has to do with what Tim said, which is that you know ostensibly, looking at a technical revision of an adaptive resource framework, doesn't necessary imply to members of the public that there is going to be a major change in stated policy.

I think I share the same concern that he referenced, with regard to the female harvest threshold that was presented in the past. I think that this sort of policy direction change that seems to be happening within this science/technical process, as a result of changing the ARM, is really the issue here for a lot of us.

Being a little bit blindsided by how that change within what seemed like it was a needed and is a needed and valid process to change the ARM. I would just say that there is a broader issue here for me, at least, and one of those is looking at the ARM goals. To me they don't show targeting and increase back to a higher population level for horseshoe crab, which would support continued success of red knots.

The ARM looks to me to project essentially a no loss, unless I'm misinterpreting it, keeping the population at current levels, which I think a lot of us thought was not the goal long term for this resource. I guess that's just a broader concern here

for me, more so than the exact data, the exact model runs, all that kind of thing.

I have good confidence in the folks who worked on this, the scientists from multiple agencies that had input. I have more of a concern with where we're trying to get, and the overall problem of shifting baselines in fisheries management, and what that means for these connected ecological resources in the future.

One other specific point I would make is again, if I am interpreting the model correctly, is that there was one statistically significant factor for adult red knot survival, which was abundance of female horseshoe crabs. I find it interesting that that was one of the only pieces of data found to be significant in the model, but yet the model is still generating a female harvest.

I didn't really understand that, maybe somebody could clarify that for me. I realize that adult survival for red knots was not found to be the major population determinant, it was more of a recruitment. However, if female horseshoe crab abundance is a significant factor for adult survival, it seems that that should be an important consideration with the federally listed species, even though it's perhaps not the major determinant of population trends for the bird. Anyway, those are my thoughts, and I appreciate your work.

CHAIR CLARK: Thanks, Matt, we appreciate the comments, and Kristen can, to the question you had in there, she can respond to that. Then we are getting a little short on time, so we're going to take one more comment from the public after Kristen responds here.

DR. ANSTEAD: Yes, thank you for that question. You are correct that there is a link between female horseshoe crab abundance and red knot survival. I think that where the confusion might be is that the horseshoe crab female population has been increasing, the adult, mature population that is going to spawn.

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If you look at either the Virginia Tech Trawl Survey by itself, we use the Delta Distribution Swept Area estimate. There are several time series in their report each year, but there is one that we use specifically, or you use our catch survey population estimates, which we think are the best estimates available.

Both of those have been increasing over time. If their female population is around 10 million mature female horseshoe crab, the model is still recommending some female harvest, because that population is considered quite high. If you have 10 million females and the harvest coming out is about 140,000 females, the model doesn't see that as conflicting in the purpose of the management.

CHAIR CLARK: We have one more comment from the public, because we are running short on time. The commenter is Faith Zerbe. We are going to have to limit it to three minutes, so thank you and take it away, Faith.

MS. FAITH ZERBE: Thank you very much, Commissioner. My name is Faith Zerbe; I'm Director of Monitoring with the Delaware River Keeper Network. I won't be using a three-minute time, so perhaps you could have others speak, if possible, if there are others. We've been monitoring horseshoe crabs along the Delaware Bay.

Myself, I've been out there for over 22 years. This year of course you've also participated in egg survey density studies that have been done by the shorebird team. We're learning a lot on the ground. I really would just urge you to use the precautionary principle here, and not allow this to move forward at this time.

Certainly, Mr. Levitan from Earth Justice has talked about the issue of USGS and this information that if they are still looking at information related to the models, understanding if the model is really operating as they would choose. Moving this forward now at this point would be premature, in our eyes.

We also would just say that the peer and then again, the presentation by the presenter was very good. It was nice to see those slides, it was very fast. There is a lot of information there also to digest, of course, so we can't just take it on the Agency standard that this is adequate for the public. The other point I would note is that it was talked about if the Commissioners do decide to move this forward today, that there may be public hearings, I believe in August or September, which we would also urge is completely premature, and would not allow adequate time for the public.

People will take vacations in August, they're getting their kids ready to go back to school, as you all talk about and have said, the public has a hard time looking at this information. It's a lot of information to digest, and Earth Justice doesn't even have the information that they requested in February. This just feels like a rush job forward, to basically turn up more female crabs for fish bait.

Again, we're on the water, we see the crabs during our spawning surveys. We've participated in bird surveys last year; the red knot was the lowest it had been in years. This just is completely flying in the face of what we need, to the point that you might have this ARM model and then you have a framework. But then we may decide not to take female crabs.

Just looking at how the industry works, and how things have been in the past. Again, we've been doing this for decades, working on this. I'm sure that if the ARM model is recommending female crab harvest, it is going to be very hard to stop that train coming from off the tracks. I would just urge you to hold the line.

It sounds like USGS is also not available to acknowledge what Mr. Levitan said. We would echo what American Littoral Society has said, and really just others on the ground and the scientists on the ground, to just please hold the line right now, and vote to not take this forward at this time. Thank you very much for your time and your attention.

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CHAIR CLARK: Thank you for the comment, Ms. Zerbe. To your specific point about the public comment period. I just want to turn it over to Caitlin again to refresh us on that before we call the question, but also to remind you that you don't have to attend a public hearing in order to comment. The comment period is going to be open for much longer. Written comments are accepted, they can be e-mailed, and they can be mailed. We want as much public input as possible in this process, and I'll let Caitlin comment further on that.

MS. STARKS: Yes, so if the document is approved today, it would take a little bit of time to set up a public hearing schedule, and get the notice out on that. It's unlikely that hearings would occur in August. I think the public comment period would be open.

But the typical process is that we have the public comment period open two weeks in advance of any public hearings, and then following the public hearings as well. There would be more time for public comment via written comments, which again can be e-mailed, mailed or faxed. Then those public hearings would probably occur in September.

CHAIR CLARK: Is there any further discussion on this motion by the Board? Okay, not seeing any, do we have any online? Given that I will call the question. Do we need time to caucus? All right, I'm not seeing anybody. Oh, you do want to caucus. Three-minute caucus.

MS. KERNS: I just want to note really quickly a clarification to what Caitlin said. We will do our best to have a two-week opening, two weeks prior and two weeks after. It is not required in Addenda, but we have heard from the public that this is complicated, and so therefore we will do our best. But if some state wants a late hearing, then we may not be able to make that perfect.

CHAIR CLARK: Okay, did everyone have enough time to caucus? Does anybody need more time? Do you need more time, Mike? Okay, before I go to you, Mike, Bill Hyatt asked to ask a question, and then I'll go to you.

MR. HYATT: If today we were to approve this to go out for public comment, and assuming then at the annual meeting we would be looking to take further action. Is it safe to assume that we could get, as that process is unfolding, some updates on where things stand relative to USGS and how they are handling the requests that have been put forth?

CHAIR CLARK: Kristen, do you want to respond to that?

DR. ANSTEAD: I want to talk a little bit about the models, just to manage expectations about this. I'm not speaking on behalf of the USGS at all. The way that this ARM revision model works is there are several models that feed into the adaptive management entirety model, so I have part of it, Anna Tucker at USGS did the bird modeling, and then they feed into this larger model.

What we have struggled with, even as a committee, is how to get that model all in one place, because of the massive size and complexity of it. Even now, my computer doesn't have enough cores to run the full ARM model, because the vision was to hand over the model to me, so I can run it each year. We have not resolved how to do that yet.

It's fairly common for a stock assessment to have models spread over several computers, so that is not unusual in this case. But this is one of the most complex models that I've worked with, and I'm not sure what the platform will be to make, that's not to say we don't want to make it public, but it will probably have to go in a GitHub, and I don't know how we will run it from there as individual people, apart from the data confidentiality. These are not excuses, this is just something we have struggled with.

MS. KERNS: Bill, we can give you an update, you know if we can get something from USGS on where they are in their internal deliberative process, to give you that. But I think what Kristen is trying to say is that your average stakeholder would not be able to run the model itself. Yes, there are individuals out there in the world that can look at

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this and do this, but your average person, I myself could never do it, I'm included in that group.

CHAIR CLARK: Follow up, Bill.

MR. HYATT: Yes, thank you, Mr. Chair. Yes, I was asking just for an update. It was specifically because what I thought I heard before, while not coming directly from the USGS, was that there was an internal review going, and that there was a commitment to, in one form, shape or another, to be able to provide this model out to those who are interested in looking at it. I don't know what form or shape that will take. What I was asking primarily is just as long as we can be assured that we're going to be updated, as information is available. Thank you.

CHAIR CLARK: Mike, you had a comment?

MR. LUISI: Yes, it was along the same lines that Bill was just asking about. I was talking to Roy, and we were saying, you know the points that were made through public comment were good points. If USGS, you know it's a shame we can't get any update from them today. But I just wonder if.

I was starting to think that maybe we can just get an agreement as direction to staff from the Board in moving forward that we pump the brake just a little bit, and give a little bit more time to the USGS to get that information out before we start to have the hearings. But I don't know if there is any appetite around the table for trying to set up something like that.

What I was thinking was, if we don't have information from USGS by October 1st, we could then go to the public to get feedback, or as part of the public comment the comment could be, we don't have the right information to comment on, and then the Board gets to deliberate on that in November as well. I see there being two ways forward, so that we get the feedback that we need from the public. But I'm not trying to complicate things.

CHAIR CLARK: Thanks, Mike, Toni has a response for you.

MS. KERNS: Mike, if we waited until October, we would not be able to bring this back to you all, so that would be too late for November. Again, I'll restate that we have had a very open and transparent process for the review of this model. If the public want to comment that they want to see different thresholds, I'm using that as a paraphrase, I know that is not the exact right term, Kristen, some other evaluation of the bird data.

Then they can provide that data to the Board and the Board can consider that as you decide how to move forward. These are products. You know what comes out of the ARM is a package, and the Board gets to decide what to do with that package. You don't have to have female harvest, and then a state can decide if they want to have female harvest if the Board approves that package.

You know I think the public can add all of these types of comments to their public comment, but in terms of the model itself and the review of it, you know we've had this transparent process. I'm not sure that is going to change. I think USGS, when they have models, do internal reviews. It's not necessarily doing this independent peer review like we completed, I think it's just an in-house process before they release packages.

CHAIR CLARK: Thanks, Toni. Before I call the question, we have another comment from Rick Jacobson.

MR. JACOBSON: This really builds on Bill and Mike's comments. If I am correct, a decision of the Commission to move forward with this motion, to adopt this motion, and go to public comment, in no way binds Commission's actions come the November meeting. Is that correct? I mean we have the opportunity to review what public comment comes in, and then consider anew what actions we feel are most appropriate to take at that time. Is that correct?

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The Board will review the minutes during its next meeting.

CHAIR CLARK: That is correct, Rick. Okay, thank you. We've had a very good discussion on this, but now it's time to call the question. All those in favor of the motion, please indicate by raising your right hand.

MS. KERNES: I have Rhode Island, Massachusetts, Connecticut, New York, New Jersey, Florida, Georgia, South Carolina, North Carolina, Virginia, Potomac River Fisheries Commission, Maryland and Delaware.

MR. WRIGHT: NOAA Votes yes.

MR. JACOBSON: U.S. Fish and Wildlife Service votes yes as well.

CHAIR CLARK: Okay, so we have two yes votes from online. All right, are we ready for no votes? **Okay, all those opposed, please raise your hand. Seeing none, and I think by process of elimination we don't have any abstentions or null votes, do we? No, okay, it looks like the motion passes, and what is the final tally, Caitlin? It's 15 in favor, 0 opposed, 0 abstentions and 0 null votes.** What are the next steps now, Caitlin? We just want to review that again.

MS. STARKS: After this meeting we will publish the document for public comment. We will release a press release with a hearing schedule. I will be reaching out to all the states to get information from each state on whether they would like having an in-person public hearing, and what their availability is to put that schedule together. Those should be our next steps; we will have a public press release to let everyone know when that comment period is open.

CHAIR CLARK: Thank you very much, Caitlin, thank you to the Board for the discussion on that and the public.

UPDATE ON PLAN DEVELOPMENT TEAM REVIEW OF THE BIOMEDICAL MORTALITY, BIOLOGICALLY-BASED OPTIONS FOR SETTING THE THRESHOLD, AND BEST MANAGEMENT PRACTICES FOR HANDLING BIOMEDICAL COLLECTIONS

CHAIR CLARK: Now we'll move on to our next agenda item, which is going to be back with Caitlin again, which is to update on Plan Development Team Review of the Biomedical Mortality Biologically-based Options for Setting the Threshold, and Best Management Practices for Handling Biomedical Collections. Take it away, Caitlin.

MS. STARKS: Thank you again. Just quickly, in this presentation I am going to go over the Board task to the Plan Development Team, provide some background information and data on the topic, and then I am going to pass it off to our Technical Committee Chair, Natalie Ameal, to cover the TCs discussion and recommendations on this issue.

Then Brett Hoffmeister, who is here at the front with us, is the Advisory Panel Chair for Horseshoe Crab, and he'll cover the AP Report. Then I will wrap up with the PDT recommendation, and set the Board up for a discussion today. The task that the Board assigned to the Plan Development Team had two components.

The first part was to review the threshold for the biomedical mortality, to develop biologically based options for that threshold, and to develop options for action when that threshold is exceeded. The second part was to review the best management practices for handling biomedical catch, and suggest options for updating and implementing the BMPs. Then the reason that the Board assigned this task, is that during the FMP review last year it was noted that the annual threshold for mortality for crab used for biomedical purposes, which is established in the fishery management plan, has been exceeded in almost all of the last 13 years.

The Board wanted to take a look into this and assign this task to the PDT. The FMP language on this states that if horseshoe crab mortality associated

with collecting, shipping, handling or use by the biomedical industry exceeds 57,500 horseshoe crabs per year, the Commission would reevaluate potential restrictions on horseshoe crab harvest by the biomedical industry.

It should be noted that this threshold was set simply based on estimates of the annual biomedical mortality at the time that the FMP was developed in the 1990s, and it does not have any scientific or biological basis to it. To provide more context, this graph shows the bait harvest levels and the biomedical mortality levels.

The orange area is the bait harvest, and the blue sliver on top is the coastwide biomedical mortality estimated in each year. As you can see the vast majority of total mortality throughout the time series is bait harvest, and the blue area representing the biomedical mortality is relatively small, and it doesn't change very dramatically from year to year.

In the whole time series, the biomedical has remained under 20 percent of the total mortality. To show this data another way, this table shows the ASMFC coastwide quota for bait in the top row, and then the second row is the total allowed bait harvest under the more restrictive state quotas. The actual coastwide bait harvest is below that in the third row, and then the next rows are the coastwide biomedical mortality estimates, and the total mortality with bait and biomedical added together.

On the bottom, the two rows there are showing the total mortality, bait plus biomedical, as a percent of the overall ASMFC quota and the combined state quotas. What you see from this is that when the biomedical mortality is added on top of bait harvest, the total has remained well below the ASMFC coastwide bait quota, and then in the final row except in 2017, it has also remained under the bait harvest limit that is allowed under the state restrictive state quotas.

That is how it compares to the ASMFC quotas for bait harvest. As we discussed earlier, the

biomedical mortality is accounted for in the ARM, in the framework revision for the Delaware Bay population, which this is the only population where we have biologically based harvest specifications. If Addendum VIII is adopted, that Delaware Bay specific biomedical mortality would be accounted for in setting the harvest specifications for the Delaware Bay.

Switching gears to the other part of this task, the best management practices for handling biomedical collections were developed by an ad hoc workgroup in 2011. This BMP list is a list of recommended practices to minimize stress injury and mortality of biomedical horseshoe crabs in every step of the process, from when they are collected to when they are returned to the sea. The horseshoe crab FMP recommends that these BMPs be followed by biomedical industry and harvesters, but the BMPs are not required by the ASMFC. What the Commission's FMP does require is that states must issue a special permit for, or authorization for collecting crabs for biomedical purposes, and also, they must return the horseshoe crabs that are taken for biomedical purposes to the same state or federal waters from which they were collected.

TECHNICAL COMMITTEE RECOMMENDATIONS

MS. STARKS: With that background, I'm going to hand it over to Natalie to present on the TC discussion, and Natalie, if you're not unmuted, please raise your hand, so we can unmute you.

MS. NATALIE AMERAL: Good morning. I think I should be unmuted. To summarize our TC discussion on the biomedical mortality threshold, the first thing we did was reach out to the staff to look at multiple CSMA runs, and population simulations. Using those, we did not find any significant impacts.

The real issue here is that we lack coastwide biological reference points, and there are regional differences in stock status. Not only can we not determine how biomedical mortality thresholds would impact each region, we are not sure how to even set that number to begin with. A lot of

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emphasis was also placed on sex ratios playing into these issues as well.

To summarize our BMP discussion. To figure out where each state stands, as far as implementing BMPs, each TC member per state provided information on what requirements currently exist. The disparities we saw between states, I think was largely attributed to different seasonality's, and harvest methods employed by each state.

If we go to the next slide, I can summarize our recommendations. Currently we don't have the data to inform upon a biologically based threshold for biomedical mortality, and also importantly, we only have a population estimate for Delaware Bay. To summarize the best management practices.

Right now, we think that our best focus for best management practices for decreasing mortality, would be to assemble a working group. I think that is recommended on the next slide. Really, if we want to spend the time to review, revise and recommend updated BMPs, we will probably need the time allowed to a working group to pursue that option. I think with that I am handing it off to Brett for the AP summery.

ADVISORY PANEL REPORT

MR. BRETT HOFFMEISTER: Thank you, Natalie, thank you, Caitlin. The AP met virtually on July 11. Caitlin started us off with a view of the TC document, or review. Right out of the gate there were comments on biomedical mortality with some of the AP members maintaining the 15 percent estimate we thought was high, pointing to the fact that as many of the papers that were used for the 2019 benchmark assessment did not follow many of the BMPs.

There was only a handful that did, so it was just really a notation. It was also pointed out that the Smith paper released in 2020 was really a good example of the effects of long-term biomedical processes. This looked at, you know almost 70,000 crabs that were bled by biomedical companies over many years.

We thought that that was a good reference. One AP member repeatedly was concerned about egg densities on the beaches, about them remaining low in the Delaware Bay region, as well as post handling effects, or biomedical use on horseshoe crabs, regardless of the estimated mortality level. This prompted some discussion, really talking about the timing of the egg density studies, the design of the studies themselves, and the fact that they weren't used in the benchmark assessment at the time. This member stated that they had a lot of data, and we encouraged them to share that with the ASMFC in the future.

As far as post handling of the biomedical crabs, the BMPs are designed to address some of that. Those were just comments there. Comments directly related to the BMPs. Another member was concerned about the vagueness of the BMP language leaving too much room for interpretation. For example, a recommendation that tows are around 30 minutes suggested that maybe we make that a requirement.

Another would be release area, you know where you should release the crab. Should it be at the same latitude and longitude location where they were caught? The biomedical members kind of countered that really the BMPs were designed to be somewhere variable, because of the practices along the coast.

As the TC noted, each state is very different in its fisheries practices. There are methods of harvest equipment that varies. The BMPs are a pretty comprehensive list of recommendations, but we didn't see that they could really be codified. Again, things such as temperature-controlled transport may make sense in one place and not another. Waters in Massachusetts are much cooler than they are in South Carolina.

Not all things considered equal, it's not really possible to have a lot of recommendations on these BMPs that will fit every nook and cranny. There was concern voiced about collection during spawning activity, and it was a reminder that many states have specific regulations to protect spawning

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horseshoe crabs, such as lunar closures, daily quotas, weekly quotas or late seasons, such as I know at least one processor in Delaware Bay Region, they don't even start harvesting until mid-June or late June.

I guess the message from the biomedical industry was that we are following the relevant and applicable BMPs, and doing everything reasonable to address mortality and injury with these crabs. It is in the best interest of the biomedical companies to do that. We need healthy animals for a good product. That was a point of some discussion.

It was also noted that the states have incorporated some of the BMPs into regulations, so things like storage conditions, transport, data collection, marking crabs prevent re-bleeding, or things that are found in some of the permitting or contingencies to permitting in some of the states. Biomedical members were suggesting some minor language changes in the elimination of a recommendation to check salinity at release point.

Prior to this meeting I did reach out to the industry. We reviewed the BMPs, and suggested some minor changes. I think you'll see some of that in the memo that is a part of the materials. It was also stated as a general statement by the biomedical companies, that the preservation of the species is a common goal. I'll just remind people that, you know we've been doing this for about 50 years, long before there was any management of the fishery itself. This has been a goal with the catch and release fishery and what not. Overall, I thought it was a good dialogue with the meeting, and there was some good input but not great surprises here. Thank you.

CHAIR CLARK: Thank you, Brett. Thanks, Caitlin and thank you Natalie. Do you have some comments to follow up?

MS. STARKS: Sorry, I just have a few more slides here. I just want to go to the next slide on the PDT recommendations. Considering what the TC and AP inputted on this issue, the PDT has made a recommendation not to use the biologically-based

biomedical mortality threshold at this time, because there is currently insufficient data to support the coastwide threshold based on biological reference points.

The PDT said that any coastwide mortality threshold would not be scientifically based. The PDT does agree with reviewing and discussing the best management practices to proposed recommended updates, which could be done through a workgroup such as what was originally done and put together to develop those BMPs.

I think to start the Board's discussion on this topic it would be helpful to hear how the Board wishes to move forward, both with the mortality threshold issue, and with the BMPs. Some questions to think about are, is the Board interested in forming a workgroup to address either of these issues, and what should the focus of that workgroup be? With that I can take any questions.

CHAIR CLARK: Okay, thank you, Caitlin. Now, thank you, Caitlin, Natalie and Brett, and does the Board have any questions or comments on the biomedical here? Emerson.

MR. EMERSON C. HASBROUCK: Thank you, Caitlin, Natalie and Brett for your presentations. My question is, since we indicate in the FMP a threshold for biomedical collection of crabs, and every year we exceed that, and we just say well, okay, we exceeded it. How do we go forward here relative to this biomedical threshold? Do we just leave the FMP as it is, and ignore it essentially, or is there some other direction we should go in? Because I understand that we cannot develop a biologically-based threshold for biomedical collection.

CHAIR CLARK: Go ahead, Caitlin.

MS. STARKS: Thanks, Emerson, for the question. I think this is really a matter of what the Board is interested in doing. There is a threshold in the FMP of 57,500 crabs for a mortality threshold for the biomedical industry. Again, that was just based on estimates of what it was at the time. If the Board

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wanted to change that threshold in some way, it would require an addendum.

I think the options for something that could be done through an addendum would be removing the threshold, modifying the threshold, or potentially changing it in some other way that a work group could potentially propose. Those are my initial thoughts on how to move forward if you want to change that threshold in some way.

CHAIR CLARK: Do you have any follow up on that, Emerson?

MR. HASBROUCK: Yes, thank you. I don't know what the sense of the rest of the Board is, but we've been ignoring that threshold for, what did you say, Caitlin, 14 years, I think. If we've been ignoring it for 14 years, I guess we could continue to ignore it, unless somebody thinks we really need to move forward with an addendum.

CHAIR CLARK: Okay, are there any other questions for Caitlin? Not seeing any, can we put the PDT recommendations back up on the screen? Oh, Bob.

EXECUTIVE DIRECTOR BEAL: While the recommendations are coming back up. Just to kind of respond to Emerson's comment. I wouldn't characterize it as the Board is ignoring the threshold. I think you know it is reported out every year where we stand relative to that threshold. The Board looks at it and decides whether it's a significant component of the mortality, and if you remember the slide with the orange block and the blue sliver, you know it's a small component.

You know I hear what you're saying. You know they haven't reacted, and haven't made any management changes. But I don't want anyone to perceive that the Board just doesn't care. The Board does get a report out where we stand relative to that number, and looks at it, and hasn't decided that it's met a threshold where we need to have a management reaction to it.

CHAIR CLARK: Caitlin.

MS. STARKS: Yes, if I could just add on to that slightly. Again, the language in the FMP says that if that threshold is exceeded the Commission would reevaluate potential restriction on horseshoe crab harvest by the biomedical industry. I do think it's accurate to say that that is what the Board has been doing every year.

When they get the report out on what the biomedical mortality estimate is, and then through this process that the Board just asked of the PDT to evaluate the information, and look into some options. I think that is a reevaluation of potential restrictions. I think what Bob says stands, and if there needs to be a change to that, the Board can initiate an addendum.

CHAIR CLARK: We have these suggestions here from the Plan Development Team of course, that if the Board was to move ahead with the workgroup, to come up with best management practices, I'm assuming a new addendum could also address the biomedical threshold. Sorry, I think I saw another hand. Dan.

MR. DANIEL McKIERNAN: I'm assuming that in the annual Plan Review Document there is a statement in there that says that even though the threshold has been exceeded, this is inconsequential, because the overall mortality is declining. Is that accurate?

MS. STARKS: Off the top of my head, I don't remember if we have a statement exactly to that effect, but it is given as a percentage of the total mortality. I don't know if there is a desire for more information, we can add it.

MR. McKIERNAN: I would recommend that that be stated, that way there is some position that we're comfortable with that says yes, we know we're exceeding it, but it's no big deal.

CHAIR CLARK: Thanks, Dan, any other comments on this? Does the Board wish to proceed with the recommendations of the PDT on this issue? Dan.

MR. McKIERNAN: Yes, I would welcome PDT analysis of the levels of mortality attributable to the

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biomedical firms, maybe on a regional basis, because since we have quotas on a regional basis, I'm sorry, on a state basis. You know as states we're managing these activities. The potential take for that industry is not infinite, and so I guess it would be good to have some kind of a conversation about that by the PDT.

CHAIR CLARK: I'm seeing shaking heads over here, Dan. I think that gets into confidentiality issues, and that's why it's not broken out that way. But is that something that can or should be looked into further, or are we kind of stuck on that?

MS. STARKS: I think that was part of what the Technical Committee discussed through this process, was that while we have the biomedical information from each of the states, and can look at it regionally. We don't have population estimates for each region, so there is no way to compare what is an acceptable level of biomedical mortality or any type of mortality, including bait for those regions, because we don't have population estimates.

CHAIR CLARK: Any follow up, Dan?

MR. McKIERNAN: Yes, well frankly we have a trend in Massachusetts that is very positive. We have an annual bait harvest that is published. We're pretty confident that the levels of mortality at this time, attributable to bait harvest and whatever is going on with the confidential biomedical harvest, is probably rather appropriate. I just don't want to be handcuffed to actually having a management strategy going forward.

I'll work with this internally. It's not necessarily for discussion today, but this does represent a blind spot for horseshoe crab management for us state managers to not even be able to assure the public that we got this. That the number of crabs being killed at a local level within a state is appropriate. I'm confident that it is, but I'm just in the future I would like to maybe make some headway on that.

CHAIR CLARK: Are there any other comments? Conor.

MR. CONOR McMANUS: I guess I would just make a comment on the second recommendation. I would support that a workgroup be developed to review the best practices. It's been a while, I believe, since there has been a formal technical amendment or review of the document. I appreciate the feedback of the AP and the TC and the PDT to date on it. I think it just provides us an opportunity to reassess the practices more holistically.

CHAIR CLARK: Thanks, Conor, I see Emerson's hand.

MR. HASBROUCK: Yes, I agree with Conor. Do we need a motion to that effect or is just consensus fine?

CHAIR CLARK: We can do it by consensus. Does the Board agree that we should put together a working group on this? I'm not seeing any opposition, so yes, we can do that. In terms of what Dan was asking, is there enough information there that something can be pursued, or are we just kind of at an impasse on that whole issue?

MS. STARKS: I think I could get more information from Dan, maybe on what he's looking for after the meeting, or now. In terms of the workgroup, I am hearing that we want to look at the BMPs. I just want to clarify. Is there any interest in thinking about this mortality issue any further, or is the Board comfortable with keeping the threshold as it is? I just want to make sure we don't need to be doing any additional work beyond looking at the BMPs.

CHAIR CLARK: We have Emerson.

MR. HASBROUCK: I'm fine with leaving things the way they are relative to the threshold. As long as we incorporate in the annual FMP review the language that Dan suggested. I think that puts us in good shape.

CHAIR CLARK: Any other comments? Dan.

MR. McKIERNAN: Yes, and I'm comfortable leaving it just to the best management practices at this

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time. I will kind of deal with my local level issues locally.

CHAIR CLARK: Thanks, Dan. Okay, any further comments on this or are we ready to move on from this topic?

REVIEW AND POPULATE THE ADVISORY PANEL MEMBERSHIP

CHAIR CLARK: Okay, not seeing any we're going to move on to our next item, which is Review and Populate the Advisory Panel Membership, and that is Tina.

MS. TINA L. BERGER: Thank you, Mr. Chairman. I offer for your consideration and approval David Meservey, an inshore commercial otter trawler from Massachusetts.

CHAIR CLARK: We also had two more from Delaware.

MS. BERGER: Okay, forgive me, but I was not aware of those nominations. But if you have them in your packet then you know better than I.

CHAIR CLARK: Okay, Tina. I think they were in the supplemental, and they are in the motion, so we are fine on that, **and we have a motion by Dan McKiernan, seconded by Emerson Hasbrouck there.** Is there any opposition to this motion?

MS. KERNS: Mr. Chairman, can you read the motion, please?

CHAIR CLARK: Oh, certainly. **Move to approve Horseshoe Crab Advisory Panel nominations for David Meservey from Massachusetts, Jordan Giuttari and Matt Sarver from Delaware.** Motion by Mr. McKiernan, seconded by Mr. Hasbrouck. **Any opposition to the motion? Seeing none; the motion is approved by consent.**

ELECT A VICE-CHAIR

CHAIR CLARK: Now we are on to our penultimate item, which is Elect a Vice-Chair. Do we have a nomination? Joe Cimino.

MR. CIMINO: I know how good it feels to have a Vice-Chair waiting in the wings. **I move to elect Dr. Justin Davis from Connecticut as Vice-Chair of the Horseshoe Crab Management Board.**

CHAIR CLARK: We have a second by Jim Gilmore. I would say everybody is in approval of this nomination. Congratulations, Justin, and thank you.

ADJOURNMENT

CHAIR CLARK: Okay that brings us to our last item, which is Other Business. In the interest of time maybe we do have a discussion maybe we could have in the future about the amount of misinformation that has been out there over this. But given that we are already running late, shall we just adjourn the meeting at this point? Okay, no objections to that, so the Horseshoe Crab Board is adjourned. Thank you.

(Whereupon the meeting adjourned at 12:00 p.m.
on Wednesday, August 3, 2022)

Horseshoe Crab Draft Addendum VIII for Public Comment

Atlantic States Marine Fisheries Commission

**DRAFT ADDENDUM VIII TO THE HORSESHOE CRAB FISHERY
MANAGEMENT PLAN FOR PUBLIC COMMENT**

Implementation of the 2021 Adaptive Resource Management Framework Revision



August 2022



Sustainable and Cooperative Management of Atlantic Coastal Fisheries

Horseshoe Crab Draft Addendum VIII for Public Comment

Public Comment Process and Proposed Timeline

In January 2022, the Atlantic States Marine Fisheries Commission's (Commission) Horseshoe Crab Management Board (Board) initiated Draft Addendum VIII to the Horseshoe Crab Interstate Fishery Management Plan to consider implementing the recommendations included in the 2021 Revision of the Adaptive Resource Management (ARM) Framework and Peer Review Report, and using the ARM Framework Revision for setting bait harvest specifications for horseshoe crabs of Delaware-Bay origin. This document presents background on the Commission's management of horseshoe crab in the Delaware Bay Region, the addendum process and timeline, a statement of the problem, and management measures for public consideration and comment.

The public is encouraged to submit comments regarding the proposed management options in this document at any time during the addendum process. The final date comments will be accepted is **September 30, 2022 at 11:59 p.m. EST**. Comments may be submitted by mail, email, or fax. If you have any questions or would like to submit comments, please use the contact information below.

Mail: Caitlin Starks

Atlantic States Marine Fisheries Commission
1050 N. Highland St. Suite 200A-N
Arlington, VA 22201

Email: comments@asmfc.org
(Subject line: Horseshoe Crab
Draft Addendum VIII)

<i>January 2022</i>	Board Initiated Draft Addendum VIII
<i>August 2022</i>	Board Approved Draft Addendum VIII for public comment
<i>September 2022</i>	Public Comment Period Including Public Hearings
<i>November 2022</i>	Board Reviews Public Comment, Selects Management Measures, Final Approval of Addendum VIII
<i>TBD</i>	Implementation of Addendum VIII Provisions

Horseshoe Crab Draft Addendum VIII for Public Comment

1.0 Introduction

The Atlantic States Marine Fisheries Commission's (Commission or ASMFC) Horseshoe Crab Management Board (Board) approved the Interstate Fishery Management Plan for Horseshoe Crabs (FMP) in October 1998. The goal of the FMP includes management of horseshoe crab populations for continued use by current and future generations of the fishing and non-fishing public, including the biomedical industry, scientific and educational researchers, migratory shorebirds, and other dependent fish and wildlife, including federally listed sea turtles. ASMFC maintains primary management authority for horseshoe crabs in state and federal waters. The management unit for horseshoe crabs extends from Maine through the east coast of Florida.

Additions and changes to the FMP have been adopted by the Board through seven addenda. The Board approved Addendum I in 2000, establishing a coastwide, state-by-state annual quota system to reduce horseshoe crab landings. Addendum I also included a recommendation to the federal government to create the Carl N. Shuster Jr. Horseshoe Crab Reserve. The Board approved Addendum II in 2001, establishing criteria for voluntary quota transfers between states. Addenda III (2004) and IV (2006) required additional restrictions on the bait harvest of horseshoe crabs of Delaware Bay-origin and expanded the biomedical monitoring requirements. Addenda V (2008) and VI (2010) extended the restrictions within Addendum IV. The provisions of Addendum VI were set to expire after April 30, 2013. Addendum VII replaced the Addendum VI requirements by establishing a management program for the Delaware Bay Region (i.e., coastal and bay waters of New Jersey and Delaware, and coastal waters only of Maryland and Virginia).

Draft Addendum VIII considers implementing the 2021 Revision to the Adaptive Resource Management (ARM) Framework originally established under Addendum VII.

2.0 Overview

2.1 Statement of the Problem

The Board initiated Draft Addendum VIII in January 2022 to consider use of the recent 2021 Revision of the ARM Framework (ASMFC 2021) in setting annual bait harvest specifications for horseshoe crabs of Delaware Bay-origin. Delaware Bay horseshoe crab management using the ARM Framework was originally established under Addendum VII for use during the 2013 fishing season and beyond. The Framework considers the abundance levels of horseshoe crabs and shorebirds in determining the optimal harvest level for the Delaware Bay states of New Jersey, Delaware, Maryland, and Virginia (east of the COLREGS).

In the past decade, more data has been collected on shorebirds and horseshoe crabs and modeling software and techniques have advanced. Additionally, the original ARM Framework used software that is now antiquated, not supported, does not run on current computer operating systems, and is limited in its capacity to incorporate uncertainty when determining optimum harvest strategies. Thus, the ARM Subcommittee was tasked with revising the ARM

Horseshoe Crab Draft Addendum VIII for Public Comment

Framework to address critiques from the previous peer review panel, include newly available data, and transition to new modeling software.

Following the recommendations of the independent peer review panel, which endorsed the ARM Revision as the best and most current scientific information for the management of horseshoe crabs in the Delaware Bay Region, the Board reviewed and accepted the ARM Framework Revision in January 2022. Draft Addendum VIII considers incorporating the recommended changes in the ARM Framework Revision into the management program for bait harvest of Delaware Bay-origin horseshoe crabs.

2.2 Background

The original ARM Framework and Addendum VII were developed in response to public concern regarding the horseshoe crab population and its ecological role in the Delaware Bay. While the stock assessment at that time (ASMFC 2009a) found increases in the Delaware Bay horseshoe crab abundance, the red knot (*rufa* subspecies), one of many shorebird species that feed on horseshoe crab eggs, was at low population levels. To address these concerns, an effort began to develop a multi-species approach to managing horseshoe crabs by employing the tools of structured decision making and adaptive management. In 2007, the Horseshoe Crab and Shorebird Technical Committees met and endorsed the development of a structured decision making (SDM) framework and adaptive management approach. An ARM Subcommittee was formed including representatives from state and federal partners, as well as horseshoe crab and shorebird biologists. The Subcommittee produced a framework for adaptive management of horseshoe crabs in the Delaware Bay that was constrained by red knots. It was peer-reviewed with a coastwide benchmark stock assessment for horseshoe crab in 2009 (ASMFC 2009a, 2009b).

Addendum VII, approved in February 2012, implemented the ARM Framework for use during the 2013 fishing season and beyond. The Framework considers the abundance levels of horseshoe crabs and shorebirds in determining the optimal harvest level for the Delaware Bay states of New Jersey, Delaware, Maryland, and Virginia (east of the COLREGS). Since 2013, the Board has annually reviewed recommended harvest levels from the ARM Subcommittee, who run the ARM model, and specified harvest levels for the following year in New Jersey, Delaware, Maryland, and Virginia.

2.3 Original ARM Framework

A goal of the ARM Framework is to transparently incorporate the views of stakeholders along with predictive modeling to assess the potential consequences of multiple, alternative management actions in the Delaware Bay Region. The ARM process involved several steps: 1) identify management objectives and potential actions, 2) build alternative predictive models with confidence values that suggest how a system will respond to these management actions, 3) implement management actions based on those predictive models, 4) monitor to evaluate the population response to management actions, validate the model predictions, and provide

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timely feedback to update model confidence values and improve future decision making, 5) as necessary, incorporate new data into the models to generate updated, improved predictions, and 6) revise management actions as necessary to reflect the latest state of knowledge about the ecosystem. The ARM Framework is an iterative process that adapts to new information and success of management actions.

Underlying the original ARM model are population models for both red knots and horseshoe crabs. The optimization routine in the ARM model determines the best choice among five potential harvest packages (numbers of male and females that can be harvested) given the current abundance of each species in order to maximize the long-term value of horseshoe crab harvest. The ARM model values female horseshoe crab harvest only when the abundance of red knots reaches 81,900 birds (a value related to the historic abundance of red knots in the Delaware Bay) or when the abundance of female horseshoe crabs reaches 80% of their predicted carrying capacity (11.2 million assuming a carrying capacity of 14 million; ASMFC 2009b). On an annual basis, the ARM model is used to select the optimal harvest package to implement for the next year given the current year's estimate of horseshoe crab abundance from the swept area estimate from the VA Tech trawl survey and a mark-resight estimate of red knot abundance.

Within this ARM Framework, a set of alternative multispecies models were developed for the Delaware Bay Region to predict the optimal strategy for horseshoe crab bait harvest. These models accounted for the need for red knot stopover feeding during migrations through the region. These models incorporated uncertainty in model predictions and are meant to be updated with new information as monitoring and management progress.

On an annual basis, the ARM model is used to select the optimal harvest package to implement for the next year given the current year's estimate of horseshoe crab abundance from the swept area estimate from the VA Tech trawl survey and a mark-resight estimate of red knot abundance. The current harvest packages for horseshoe crab bait harvest that can be selected by the ARM model are:

- Package 1) Full harvest moratorium on both sexes
- Package 2) Harvest up to 250,000 males and 0 females
- Package 3) Harvest up to 500,000 males and 0 females
- Package 4) Harvest up to 280,000 males and 140,000 females
- Package 5) Harvest up to 420,000 males and 210,000 females

The numbers of horseshoe crabs in the packages listed above are totals for the Delaware Bay Region, and not per state. Since its implementation in 2013, neither the 81,900 red knot threshold nor the 11.2 million female horseshoe crab thresholds have been met and harvest package 3 has been selected every year by the Framework and specified by the Board for the Delaware Bay bait harvest limit.

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2.4 Allocation of the ARM harvest output

The ARM Framework incorporates horseshoe crabs from the Delaware Bay Region as one unit. The modeling and optimization portions of the Framework do not address distribution and allocation of the harvest among the four Delaware Bay states. Allocation of the overall Delaware Bay harvest allowance was established in Addendum VII. Based on tagging and genetic analysis (ASMFC 2019, 2021), there is very little exchange between Chesapeake Bay and Delaware Bay horseshoe crab populations. However, there is movement of horseshoe crabs between coastal embayments (from New Jersey through Virginia) and Delaware Bay.

An allocation model for the four Delaware Bay states was developed to allocate the optimized harvest output by the ARM Framework, which is described in Section 2.4 of Addendum VII, and summarized below.

Each state’s allocation of the total Delaware Bay-origin harvest recommended by the ARM Framework was determined by multiplying the state’s quota under Addendum VI by the proportion of the state’s total harvest that is of Delaware Bay-origin (λ), then dividing this value by the sum of the values for each of four states (Table 1). The state λ values established in Addendum VII were based on the genetic data available at the time. Virginia’s quota level and landings refer to those quota and landings that occur east of the COLREGS line, as these crabs have been shown to be part of a mixed stock.

Table 1. Calculation of State Allocations of Delaware Bay Harvest Established in Addendum VII

State	Lambda	Addendum VI Quota	Delaware Bay-Origin Quota	Add VII Allocation of Delaware Bay-Origin Quota
NJ	1.00	100,000	100,000	32.4%
DE	1.00	100,000	100,000	32.4%
MD	0.51	170,653	87,033	28.2%
VA (east of COLREGS)	0.35	60,998	21,349	7.0%

Along with the state allocation percentages, Addendum VII also established two additional provisions impacting the state quotas for Maryland and Virginia. First, it established a harvest cap for Maryland and Virginia, which set a maximum limit on the total level of allowed harvest by Maryland and Virginia to provide protection to non-Delaware Bay-origin crabs. The cap is based on Addendum VI quota levels for Maryland and Virginia; the Maryland cap is 170,653 crabs, and the Virginia cap is 60,998 crabs. These caps apply except when the ARM Framework recommends a package that prohibits harvest of female horseshoe crabs. When female harvest is prohibited, a second provision allows for a 2:1 offset of males:females for Maryland and Virginia, which allows the total male harvest of Maryland and Virginia to rise above the cap level. Note again that Virginia’s quota only refers to the number of crabs that can be harvested east of the COLREGS line.

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3.0 Management Options

When the Board takes final action on the addendum, there is the opportunity to select any measure within the range of options that went out for public comment, including combining options across issues.

Draft Addendum VIII considers two management options:

- Option A: No action
- Option B: Implement the ARM Revision for setting bait harvest specifications for Delaware Bay-origin horseshoe crabs

Option B includes additional sub-options to specify how annual harvest recommendations will be made based on the output of the ARM model.

Option A: No Action

Because the ARM Framework adopted under Addendum VII can no longer be updated due to its obsolete software, under this option, the management program would revert back to the provisions implemented under Addendum VI. These include the following harvest quotas and limitations for New Jersey, Delaware, Maryland, and Virginia.

Addendum VI prohibits directed harvest and landing of all horseshoe crabs in New Jersey and Delaware from January 1 through June 7, and female horseshoe crabs in New Jersey and Delaware from June 8 through December 31. It also limits New Jersey and Delaware's harvest to 100,000 horseshoe crabs per state per year.

Addendum VI prohibits directed harvest and landing of horseshoe crabs in Maryland from January 1 through June 7 for two years, from October 1, 2006 to September 30, 2008. It also prohibits the landing of horseshoe crabs in Virginia from federal waters from January 1 through June 7.

Addendum VI mandates that no more than 40% of Virginia's annual quota may be harvested east of the COLREGS line in ocean waters. It also requires that horseshoe crabs harvested east of the COLREGS line and landed in Virginia must be comprised of a minimum male to female ratio of 2:1.

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Table 2. Commercial horseshoe crab bait harvest quotas for the Delaware Bay states under Addendum VI.

Jurisdiction	Addendum VI ASMFC Quota
NJ*	100,000
DE*	100,000
MD	170,653
VA**	152,495
DELAWARE BAY TOTAL	523,148

*Male-only harvest

**No more than 40% of Virginia’s annual quota may be harvested east of the COLREGS line in ocean waters. Horseshoe crabs harvested east of the COLREGS line and landed in Virginia must be comprised of a minimum male to female ratio of 2:1.

Option B: Implement the ARM Revision for setting bait harvest specifications for Delaware Bay-origin horseshoe crabs

This option would adopt the updates to the ARM Framework recommended in the 2021 Revision and incorporate them into the process for setting specifications for bait harvest of Delaware Bay-origin horseshoe crabs. Changes to the ARM Framework are described in detail in the 2021 Revision to the Adaptive Resource Management Framework and Peer Review Report, and include:

- Catch multiple survey analysis (CMSA) to estimate male and female horseshoe crab population estimates using all quantifiable sources of mortality (i.e., natural mortality, bait harvest, coastwide biomedical mortality, and commercial dead discards) and several abundance indices from the Delaware Bay Region
- Integrated population model (IPM) to quantify the effects of horseshoe crab abundance on red knot survival and recruitment based on data collected in the Delaware Bay
- Transition to new modeling approach which can be implemented through readily available R software and incorporates uncertainty on all life history parameters for both horseshoe crabs and red knots
- Harvest recommendations based on a continuous scale rather than discrete harvest packages as in the previous Framework
- Female harvest decoupled from the harvest of males

Harvest Recommendations

Harvest recommendations under the ARM Revision are based on a continuous scale rather than the discrete harvest packages in the previous Framework. Therefore, any harvest number up to the maximum allowable harvest could be recommended, not just the fixed harvest packages. Harvest of females is decoupled from the harvest of males so that each are determined separately. The maximum possible harvest for both females and males are maintained as in Addendum VII at 210,000 and 500,000, respectively.

Although harvest is treated as continuous in the new ARM Framework, if the continuous harvest recommendations were made public, it would be possible to back-calculate the

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biomedical mortality input, which is confidential. Therefore, it is necessary to round the continuous sex-specific harvest outputs to obscure the confidential biomedical data, unless the maximum sex-specific harvest is recommended. There are two sub-options for rounding the harvest output from the ARM Framework:

- **Sub-option B1:** Round down continuous optimal harvest recommendation to nearest 25,000 horseshoe crabs. For example, if the continuous optimal harvest recommendation is 135,000 males and 96,000 females, these values would be rounded down to 125,000 males and 75,000 females.
- **Sub-option B2:** Round down continuous optimal harvest recommendation to nearest 50,000 horseshoe crabs. For example, if the continuous optimal harvest recommendation is 135,000 males and 96,000 females, these values would be rounded down to 100,000 males and 50,000 females.

The Board is seeking public input on the level of rounding of the optimal harvest recommendation. Sub-option B2 would be more conservative, but sub-option B1 would yield harvest levels closer to the optimal harvest.

Adaptive management cycle

Under this option the adaptive management cycle would include three tiers of short and longer term management, update, and revision processes for the ARM Framework, as follows:

1. **Annual management process:** The annual specification of harvest will occur at the ASMFC annual meeting in calendar year t for the harvest to be implemented the following season (year $t+1$). The CMSA requires multiple indices of abundance and removals from multiple sources. Because the necessary data take time to be finalized, and final data for a given year would not be available by the time of the annual meeting, the results of a run of the CMSA in year t will be based on data obtained from the previous two years. Inputs to the CMSA will include the Virginia Tech trawl survey that is conducted in the fall of year $t-2$; Delaware and New Jersey trawl surveys from year $t-1$; and removals from year $t-1$. To match the abundance estimates of horseshoe crabs with red knot mark-resight population estimates, horseshoe crab abundance estimates from year $t-1$ and red knot population estimates from year $t-1$ will be used as input to the ARM Revision harvest policy functions in year t . Optimal harvest recommendations can then be implemented in year $t+1$. The two year time lag between data availability and implementation of optimal harvest was incorporated in the ARM Revision modeling when determining what the optimal harvest would be based on horseshoe crab and red knot abundance.

Each annual step is identified in the timeline below:

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- April - July (year t) – The ARM workgroup compiles monitoring data to run the CMSA (Virginia Tech trawl survey data from year $t-2$, New Jersey and Delaware survey data from year $t-1$, removal data from year $t-1$). The ARM workgroup estimates red knot stopover population size from the mark-resight analysis in year $t-1$.
 - August (year t) – The ARM workgroup inputs horseshoe crab and red knot population estimates to the ARM Revision harvest policy functions and calculates the optimal harvest.
 - September (year t) – The Delaware Bay Ecosystem Technical Committee reviews the ARM Revision results and optimal harvest recommendations.
 - ASMFC Annual Meeting (year t) – The Management Board reviews the optimal harvest recommendations from the ARM workgroup and decides on the harvest to be implemented in year $t+1$.
2. **Interim update process:** Every three years, an update process would occur in which the model parameters (e.g., red knot survival and recruitment, horseshoe crab stock-recruitment relationship) are updated based on the annual routine data collected in the region.
3. **Revision process:** every 9 or 10 years (or sooner if desired by the Board), the ARM Framework should undergo a revision process similar to what occurred for the 2021 ARM Revision. This amount of time is appropriate given it allows for two updates to occur, and encompasses one generation for horseshoe crabs. This should incorporate the following components:
- Solicit formal stakeholder input on ARM Framework to be provided to the relevant technical committees
 - Technical committees review stakeholder input and technical components of ARM models and provide recommendations to the Board
 - At the ASMFC Spring Meeting, Board selects final components of the ARM Framework, and tasks technical committees to work with ARM Working Group to run models /optimization
 - Merge with the annual management process
 - In August, ARM Subcommittee runs models/optimization
 - At the ASMFC Annual Meeting, the Board revisits harvest decision

If Option B is selected, implementation of the ARM Framework Revision would likely occur for the 2023 fishing season, with Board review and decision-making likely to occur at the Board's 2022 annual meeting.

Allocation of the Delaware Bay-origin harvest recommendation

Under this option, the allocation methodology established in Addendum VII would be modified to update state lambda values as recommended in the 2021 Revision based on more recent genetic data analysis. Lambda indicates how much of a state's harvest is of Delaware Bay-origin (i.e., has spawned at least once in Delaware Bay). Lambda shall be assumed to be 1.00 for New

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Jersey and Delaware and based upon the recent genetics data and analysis (ASMFC 2021), 0.45 for Maryland, and 0.20 for Virginia.

State	Lambda, λ
NJ	1.00
DE	1.00
MD	0.45
VA	0.20

Allocation values will be calculated using the same formula used under Addendum VII. Lambda will be multiplied by the state’s Addendum VI quota. The resulting value will be divided by the sum of values for all four states to provide the percent of the Delaware Bay harvest recommendation that will be allocated to each state. Virginia’s quota level and landings refer to quota and landings that occur east of the COLREGS line, as these crabs have been shown to be part of a mixed stock (Shuster 1985).

State	Allocation of Delaware Bay Harvest (%)
NJ	34.6%
DE	34.6%
MD	26.6%
VA	4.2%

Harvest cap for Maryland and Virginia

Under this option the harvest cap for Maryland and Virginia established under Addendum VII will be maintained. The harvest cap places a maximum limit on the total level of allowed harvest by Maryland and Virginia, providing protection to non-Delaware Bay-origin crabs. The cap is based on Addendum VI quota levels for Maryland and Virginia. Note again that Virginia’s quota only refers to the amount able to be harvested east of the COLREGS line.

MD Cap	VA Cap
170,653	60,998

These caps shall apply except when the ARM Framework outputs an optimized harvest that prohibits harvest of female horseshoe crabs. In this situation, female horseshoe crab harvest in Maryland and Virginia will be prohibited but a 2:1 offset of males:females shall apply and allow the total male harvest of Maryland and Virginia to rise above the cap level.

2:1 Male:female offset for female crabs below the Addendum VI levels

When a female harvest moratorium output by the ARM Framework restricts female crab harvest in Maryland and Virginia below the Addendum VI quota levels, male harvest would be

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increased at a 2:1 ratio. These increases are the only allowable increases above the designated harvest cap above. The offsets assume an allowed harvest under Addendum VI in Virginia of 20,333 female crabs and in Maryland of 85,327 female crabs.

Fallback option if ARM Framework cannot be used

As part of the 2021 ARM Framework Revision, the models are dependent on annual data sets for the yearly harvest setting, and include the following:

- Horseshoe crab abundance estimates from the Virginia Tech Horseshoe Crab Trawl Survey
- Horseshoe crab relative abundance indices from Delaware and New Jersey fishery-independent surveys
- Total horseshoe crab removals (bait harvest, biomedical mortality, and estimated commercial discards)
- Horseshoe crab spawning beach sex ratio from the Delaware Bay Horseshoe Crab Spawning Survey
- Red knot abundance estimates, including stopover counts and re-sightings

The absence of these annually-collected data sets could inhibit the use of the ARM Framework depending on which data sets were missing. If model results were not available for the fall harvest decision, the Board, via Board action and after consultation of the relevant Technical Committees and Advisory Panels, may set the next season's harvest by one of the following methods:

- Based upon Addendum VI quotas and management measures for New Jersey, Delaware, and Maryland, and Virginia coastal waters; or,
- Based upon the previous year's ARM Framework harvest level and allocation for New Jersey, Delaware, and Maryland, and Virginia coastal waters. Harvest could be more conservative than the previous year's ARM Framework harvest level and allocation for New Jersey, Delaware, and Maryland, and Virginia coastal waters.

4.0 Compliance

TBD

5.0 Literature Cited

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Appendix A. Example Allocation of Delaware Bay Horseshoe Crab Harvest

Table 1. Horseshoe crab and red knot population estimates and resulting harvest recommendation for 2017-2019 based on the 2021 ARM Revision. Coastwide biomedical mortality was used for model development, so actual Delaware-Bay specific values will likely result in slightly lower population estimates and harvest levels. Source: Supplemental Report for ARM Revision, Table 11.

Year	CMSA Estimates		Red knots	Optimal HSC Harvest (revised ARM)	
	Female HSC	Male HSC		Female	Male
2017	10,967,100	31,664,430	49,405	154,483	500,000
2018	9,735,690	24,715,290	45,221	146,792	500,000
2019	9,357,400	21,897,920	45,133	144,803	500,000

Table 2. Example allocation of the Delaware Bay optimal horseshoe crab harvest using the 2019 Optimal HSC Harvest (see Table 1). Top: Example allocation under Option B, sub-option B1. Bottom: Example allocation under sub-option B2. Total quota includes crabs of non-Delaware Bay Origin.

State	DE Bay Origin Quota			Total Quota		
	Sexes Combined	Male	Female	Sexes Combined	Male	Female
DE	216,268	173,014	43,254	216,268	173,014	43,254
NJ	216,268	173,014	43,254	216,268	173,014	43,254
MD	166,080	132,864	33,216	170,653	136,522	34,131
VA*	26,384	21,107	5,277	60,998	48,798	12,200
Total	625,000	500,000	125,000	664,187	531,349	132,837

State	DE Bay Origin Quota			Total Quota		
	Sexes Combined	Male	Female	Sexes Combined	Male	Female
DE	207,617	173,014	34,603	207,617	173,014	34,603
NJ	207,617	173,014	34,603	207,617	173,014	34,603
MD	159,437	132,864	26,573	170,653	142,211	28,442
VA*	25,328	21,107	4,221	60,998	50,832	10,166
Total	600,000	500,000	100,000	646,885	539,071	107,814

*Virginia's total quota refers to the number of crabs that can be harvested in Virginia state waters east of the COLREGS line.



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MEMORANDUM

TO: Horseshoe Crab Management Board
FROM: Caitlin Starks, Senior FMP Coordinator
DATE: October 20, 2022
SUBJECT: Public Comment on Draft Addendum VIII to the Horseshoe Crab Fishery Management Plan

The following pages represent a draft summary of all public comments received by ASMFC on Horseshoe Crab Draft Addendum VIII as of 11:59 PM (EST) on September 30, 2022 (closing deadline). Comment totals for the Draft Addendum are provided in the tables below, followed by summaries of the state public hearings, and written comments sent by organizations and individuals. A total of 34,631 written comments were received. These included eight form letters submitted by a total of 33,932 individuals, 24 letters from organizations, and 245 comments from individual industry stakeholders and concerned citizens. Four public hearings were held (three virtual and one in-person hearing in Virginia). The total public attendance across the four hearings was 69, though some individuals attended multiple public hearings. Eighteen individuals provided comment at public hearings.

For the purposes of this summary, three or more comments that have the same language or state support for an organization’s comments are considered form letters. However, if the commenter provides additional comments/rationale related to a potential management action beyond the organization’s or letter’s comments, then it is considered an individual comment.

The following tables are provided to give the Board an overview of the support for each of the management options contained in Draft Addendum VIII. Comment totals by state for comments provided during public hearings were tallied based on the hearing attended. It should also be noted that some individuals provided comments at a public hearing and also submitted written comments, and these are counted separately in the tables below. Additional comments that did not indicate support for a particular option are included in the breakdown of total comments received. Prevailing themes from the public comments on Draft Addendum VIII, including rationales for support or opposition and general considerations, are summarized below the tables.

Table 1. Support for Draft Addendum VIII Options indicated in written comments submitted to ASMFC & comments provided at public hearings

	Option A	Option B	Sub-option B1	Sub-Option B2	No Option Selected
Form Letters	34,399	0	0	0	5
Written Comments	108	1	0	1	160
Public Hearings					
New Jersey	4	1	1	0	0
Delaware	1	0	0	0	7
Maryland	2	0	0	0	2
Virginia	0	1	0	0	0
Total	34,459	3	1	1	169

Table 2. Breakdown of Total Comments Received by Category

Comments Received by Category	
Form Letter 1	25,948
Form Letter 2	4,010
Form Letter 3	15
Form Letter 4	289
Form Letter 5	674
Form Letter 6	2,987
Form Letter 7	4
Form Letter 8	5
Form Letter 9	412
Total Form Letters	34,344
Organization Letters	24
Individual Comments	245
Total Written Comments	34,613
Comments Provided at Public Hearings	
New Jersey	5
Delaware	8
Maryland	4
Virginia	1
Total Comments Received	34,631

Support for Option A. No action

Organizations and individuals in support of Option A (No action) based their decision upon concern over how any change in the current regulations for horseshoe crabs could have direct and indirect negative effects on the horseshoe crab population, the red knot population (listed as threatened on the Endangered Species Act [ESA]), and the overall ecosystem balance.

Additional Rationales Provided

- Opposition to female horseshoe crab harvest permitted by the revised Adaptive Resource Management (“ARM”) Framework
- Prior population thresholds set for female horseshoe crabs (11.2 million individuals) and *rufa* red knot (81,900 individuals) in the original ARM Framework have not been reached and should not be disregarded in Addendum VIII.
- Concern about red knot counts being low in 2022
- The new framework does not include as a management objective the timely increase of either the horseshoe crab or red knot populations toward any metric related to an estimate of ecological carrying capacity, as the original ARM had done.
- The revised ARM Framework’s assumptions and decisions do not properly support knowledge of red knot reliance on horseshoe crab eggs at the Delaware Bay.
 - Lack of confidence in the assessment that horseshoe crabs and red knots metrics are high enough to warrant any increase in horseshoe crab harvest quota

- Red knot populations are too low to risk further inhibiting their population growth by modifying horseshoe crab harvest quota, thus reducing horseshoe crab egg availability.
 - Safeguards are lacking for the uncertainty inherent in the population models that underpin the ARM model, and in the ARM model itself.
- More population dynamics should be included in the new ARM Framework as it is too narrowly focused in how it determines a healthy horseshoe crab population.
 - Horseshoe crab abundance data (mark-resight and counts) from 2011-2020, show a fairly stable horseshoe crab population but do not consider the relative decline from a much higher pre-1990's population size.
 - Spring surveys in 2021 and 2022 which were not included in the Framework showed significant decline in population size suggesting greater variation and instability in the population than the Framework supports.
 - Horseshoe crab egg density surveys and spawning survey and red knot field surveys should be included as they are reliable indicators of horseshoe crab population and are an index of value for red knots and other shorebirds by showing the relationship between horseshoe crab egg availability and shorebird abundance.
 - Egg density surveys conducted by the Delaware Bay Shorebird Project and other organizations, do not support the assertion that horseshoe crab populations are recovering from their population crash in the 1990s.
- No change in the ARM model should occur until the US Fish and Wildlife Service (USFWS) has completed its Critical Habitat Designation process for red knots which will likely highlight the Delaware Bay as a critical habitat to preserve, thus, implying preservation of a high quantity of horseshoe crab eggs as necessary for a successful migration and breeding season for red knots.
 - The USFWS Draft Recovery Plan for red knots states that reduced food availability in the Delaware Bay is a driving factor behind red knot decline which led to its listing under the ESA.
- Any increase in horseshoe crab harvest (especially female) could have negative cascading effects to red knots, the fishing industry, and the overall ecosystem.
 - Many species diets rely on horseshoe crab eggs.
 - Red knots are dependent on horseshoe crab egg consumption during their migratory stopover therefore a change in female horseshoe crab abundance could hinder the population dynamics of a threatened species.
 - Recreational fisheries could be affected though changes in population dynamics of sportfish like striped bass and flounder, which consume horseshoe crab eggs.
- Opposition to the raw data, modeling, and analysis in the new ARM Framework not being available for review by the general public and concerned stakeholders to objectify verify.
 - The general public would not be able to review all data for the continuous harvest recommendations due to the inclusion of confidential data.
 - If all data sets (biomedical mortality) were accessible to review by the public and interested scientific communities there would be greater confidence in the ARM Framework, and the biomedical industry would be held accountable for its impact on horseshoe crab abundance and essential related interspecies relationships

Support for Option B. Implement the ARM Revision for setting bait harvest specifications for Delaware Bay-origin horseshoe crabs

Comments from organizations in support of Option B were based upon the desire to use science-based management, and the new ARM Framework's ability to make updates and improvements to the ARM modeling approach, inputs of new data, and continuation of multispecies management models.

Additional Rationales Provided

- Option B is science-based.
- Support for the Revised ARM Framework as a management approach, but without female harvest for ten years.
- Support for the research recommendations of the framework revision that has informed the proposed addendum, in particular the data collection to support 1) inclusion of egg density into the management model and 2) research on the effects of climate change on spawning and breeding habitat for the crabs and birds

General Considerations

Among the organization and individual written comments, stakeholders addressed a number of general considerations. Prevailing themes included concern over any increase in harvest, especially female harvest, and ensuring ecosystem-based management that supports interspecies conservation, limits industry harvest, and proactively addresses climate change impacts.

- Regardless of which option is selected, there should be a moratorium on the harvest of female horseshoe crabs in the commercial fishery and the biomedical industry.
 - Any harvest of female horseshoe crabs would lower the egg availability for consumption by the migratory red knot population.
- Desire for more holistic ecosystem-based management approach that supports protection across the food web against cascading negative effects caused by horseshoe crab harvest
 - Destabilizing the horseshoe crab population dynamics in Delaware Bay could have future negative consequences for the entire ecosystem.
 - Local breeding fish, crabs, birds, and reptiles consume these eggs, creating ecological linkages of impact that extend far beyond the Delaware Bay.
- Concerns about observed negative trends in the Virginia Tech trawl survey
- The Commission should consider how climate change and sea level rise may further hinder horseshoe crab population growth and management, red knot population recovery, and other long-distance migratory shorebirds, and the health of the Delaware Bay ecosystem.
 - Effects of sea level rise and warmer water temperature on horseshoe crab spawning and survival
 - Increase in frequency and severity of storms may change beach habitat availability for spawning horseshoe crabs
- Concern over the number of horseshoe crabs used by the biomedical industry and how bleeding may increase risk of female post discard mortality
 - Desire for better assessment of post-release mortality of horseshoe crabs collected by the biomedical industry
 - Request for no female horseshoe crab harvest for the biomedical industry
 - Request for ASMFC to encourage the biomedical industry to switch to synthetic alternatives to horseshoe crab harvest for bleeding whenever possible
- Concern over how maximizing harvest of horseshoe crabs as bait for the conch (whelk) and eel fisheries may lead to further damage to horseshoe crab populations, red knot populations, and the overall ecosystem
 - The bait harvest industry should be encouraged to find a bait alternative due to the keystone role of horseshoe crabs within their ecosystem.
 - Eel and conch fisheries should be limited because populations are not in good condition.
 - Encourage states to mandate bait-saving technology by fishermen
 - Request for no female horseshoe crab harvest for bait

- Anecdotal observations by lifelong residents to the Delaware Bay area and volunteers for horseshoe crab counts suggest that the Delaware Bay horseshoe crab population has not rebounded to the degree necessary to permit any increase in the harvest quota.
- The red knot migratory stopover in the Delaware Bay area has become a tourist attraction that seasonally supports the local economy.
 - Reduction of horseshoe crab egg availability would deter the stopover of red knots in the Delaware Bay, putting at risk the associated economic influx from ecotourism in the area specifically for this event.

Horseshoe Crab Draft Addendum VIII Public Hearings

New Jersey Webinar Hearing

September 7, 2022

23 Public Participants

Commissioners: Joe Cimino (NJ), John Clark (DE), Rick Jacobsen (USFWS), Chris Wright (NOAA)

ASMFC & State Staff: Caitlin Starks (ASMFC), Kristen Anstead (ASMFC), Linda Barry (NJ), Jeff Brust (NJ), Margaret Conroy (DE), Mike Celestino (NJ), Heather Corbett (NJ), Samantha MacQuesten (NJ), Jordan Zimmerman (DE)

Hearing Overview

- Five individuals provided public comments
- Four attendees supported Option A, no action
 - Concerns were raised by multiple participants that the models were not made available for review by the public. Staff responded that the agencies are in the process of publishing the models and they cannot be shared at this time for proprietary reasons and due to confidential data, but they are not refusing to share them.
 - Concern that female harvest is a threat to the population recovery of red knots, as well as the horseshoe crab population
- One attendee supported Option B, and sub-option B1 because it is a science-based choice
- Staff explained what the next steps for Board action could be at the meeting in November. The Board could select either option, and would then need to set the specifications for 2023 based on the management program selected.

Public Comment Summary

Timothy Dillingham, American Littoral Society (NJ)

- As a supporter of red knot recovery we have a lot of concerns with the proposal.
- Shorebird biologists counted around 7,000 knots this year, which is low. The birds are still in a dire situation and not showing signs of recovery.
- There is debate about the rate of horseshoe crab population growth, especially for females which are key to both populations' recovery.
- Was supportive of the idea of the ARM originally, and participated on committees when it was envisioned and developed
- Disagrees that there should be any female harvest
- There are questions about the population models and the inputs, but the public have not been able to review and evaluate them
- There has not been enough public engagement on this issue
- Not opposed to updating the model but urges the thresholds in the original ARM framework to be restored
- Does not make sense to increase female harvest for fisheries (eel, conch) that are in poor condition themselves

Zoe Leach (NJ)

- Does not support Option B
- Strongly opposes harvest of female horseshoe crabs

- They are listed as vulnerable on the IUCN red list
- Thinks it is unwise to harvest females when we rely on the crabs for medical purposes
- It is unwise to endanger their population and does not seem like a good use to use them as bait, especially for fishing for eel, which have a depleted population

Kyle Fisher, local waterman (NJ)

- In favor of Option B and sub-option B1
- This option is based on actual science of the local population in the Delaware bay
- Responded to comments from others on the status of the fisheries for eel and conch, and using horseshoe crab as bait for those fisheries:
 - Cannot speak for conch but can for eel. Thinks there is a correlation in the amount harvested and the number of fishermen pursuing those species. In his area of the Delaware Bay there are maybe only four fishermen that fish for eel. The further down the bay you go the fewer there are. Regarding the statement that they are depleted, he says that while tending crab pots today he threw over a dozen large eel from his traps, and the crab pot has a bigger size mesh so they should be able to get out. That gives some perspective on Delaware Bay population of eel. Thinks research on the correlation between number of fishermen and the weight of landings might show some clarity on the state of the eel fishery.

Laura Chamberlain (NJ, reTURN the Favor horseshoe crab rescue)

- Supports Option A
- Works with volunteers on beaches saving stranded crabs, many of whom live in NJ but also come from other states in the region.
- Shares concerns about female harvest and the transparency of the models raised by Tim and David.
- The spawning data are not being used in a way that is indicating what is happening on beaches, and egg density data not being used, so we are not looking at what is going on the beaches where the birds are using the eggs and where the greatest impacts are.
- It is not clear how the Board chooses the harvest levels, what the role of stakeholders in that process is, and how to move forward without understanding what female harvest could be.
- There are a lot of stakeholders to consider for female horseshoe crabs.
- The Board should apply the precautionary principle here. Without females we are putting future of the species at risk.
- Opposed to revisions of the ARM model

David Mizrahi (NJ, Audubon Society)

- Does not support the current options
- Vice President for research and monitoring for NJ Audubon, and a shorebird ecologist in the Delaware Bay.
- Disagrees with the account given that the federal agencies are willing to share the models. Audubon's request under the freedom of information act (FOIA) was denied due to "deliberative process." ASMFC is asking for comments on this without the ability to review the models.
- Opposes the revision and Draft Addendum 8.
- This Addendum and previous addenda have not addressed egg density on beaches, which is the more important factor for red knot recovery.
- Egg densities have not increased over the last decade.

**New Jersey Hearing Attendance
Wednesday, September 7, 2022**

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Faith	Zerbe	Bristol	Pennsylvania	faith@delawareriverkeeper.org
Jordan	Zimmerman	Dover	Delaware	jordan.zimmerman@delaware.gov

Horseshoe Crab Draft Addendum VIII Public Hearings

Delaware Webinar Hearing

September 8, 2022

24 Public Participants

Commissioners: John Clark (DE), Chris Batsavage (NC), Chris Wright (NOAA)

ASMFC & State Staff: Caitlin Starks (ASMFC), Kristen Anstead (ASMFC), Toni Kerns (ASMFC), Tina Berger (ASMFC), Tracey Bauer (ASMFC), Margaret Conroy (DE), Samantha Robinson (DE), Jordan Zimmerman (DE)

Hearing Overview

- Eight individuals provided public comments
- One commenter preferred Option A of the two available options, but does not necessarily agree that the Addendum VI measures are the best solution for management
- The other seven commenters did not support either addendum option
- The commenters do not support any female harvest at this time
- Two commenters advocated for a full moratorium for bait harvest of horseshoe crabs
- Several individuals commented that they are supportive of adaptive resource management and acknowledge the strength of the science of the ARM Framework Revision, but would like to see further improvements (incorporation of more years of data, egg density data, and carrying capacity) before it is used to set specifications
- Staff explained that even if the ARM Revision is adopted to produce optimal bait harvest recommendations, the Management Board and the states have the option to implement more restrictive harvest levels than what is recommended

Public Comment Summary

Steve Cottrell (DE, Audubon Society)

- Neither of the addendum options are good enough.
- Will advocate for a full moratorium on bait harvest.
- Red knot population numbers from the ARM model do not align with the numbers from observational surveys. There are two populations of red knots, but only those migrating from Tierra del Fuego in South America rely on the horseshoe crab eggs for their migration.

MaryCatherine Feola (PA)

- Does not support this addendum and is not for the harvest of any female horseshoe crabs in the bay because it is a keystone species.
- The horseshoe crab population is far from healthy, and we cannot undermine the efforts to recover it.

Mark Martell (DE, Audubon Society)

- Asked about the economic value of female horseshoe crab harvest
- Will advocate for a moratorium

Donna Repoli (NJ, American Littoral Society)

- Prefers Option A to revert back to Addendum 6 quotas over allowing female harvest.

- Addendum 8 is too risky on an ecological standpoint.
- Feels like economics are being valued over ecology, but both are interlinked. If populations of crabs are too low then the economics also suffer.
- Computer models are not flawless and mistakes can be costly to the ecosystem, and economically as well.
- We have not met the abundance thresholds to allow female harvest.
- We need to have more of a middle ground. We do not have to have ecological risk to have economic benefits.
- The Addendum needs revisions and changes because I do not support either option.
- States should not be given the power to do what they want because they are always going to act in their economic interest.
- The models place blatant value on harvest and not on actual conservation.

Chris Bason (Delaware Center for Inland Bays)

- There is not a clear choice for either option in the Addendum
- Do not support female harvest at this time.
 - Significant consideration should be given to the Virginia Tech Trawl survey because it does not show a strong increase in the horseshoe crab population but it is the only survey used that specifically targets horseshoe crab.
 - More information on egg abundance and distribution is needed. Studies and anecdotal information indicate that in the past there were much greater egg densities on the beaches.
 - Concerned about the impact female harvest could have on red knots.
 - Unclear how climate change is going to impact both crabs and birds.
- Suggested that no female harvest should be permitted for 10 years. This would allow for testing of the ARM model projections. It also aligns well with the proposed timing of another revision cycle under Option B.
- Supports the research recommendations on egg density and climate change.
- Requests development of ecosystem-based management research that would elucidate predator-prey relationships of shorebirds, forage fish, and other species that interact with horseshoe crab in the food web.
- Provided background on the Delaware Center for Inland Bays
 - The inland bays support a significant population of horseshoe crabs, which is indistinct from the Delaware Bay region population.
 - The Center has a management plan for inland bays that focuses on reversing eutrophication and restoring species and habitats. The objective is to restore fish populations and habitat through ecosystem-based management. There is also an environmental monitoring plan, with actions related to horseshoe crabs including the spawning survey. The survey found that the inland bay population is stable and is slightly lower than the bay side. They do not have large aggregations of birds, but eggs are still important to other species in the inland bays.
- Thanks the Commission for adding more empirical data from Delaware Bay into the ARM model and acknowledges the revision and research recommendations. Very thankful for the science and management, and also appreciate the economic value of the fishery.

Leah Zerbe (PA)

- Is a volunteer horseshoe crab monitor and nature educator in PA.

- It seems like there is not a consensus among stakeholders that eggs densities are where they need to be to support the populations of horseshoe crab and red knots.
- Do not support female harvest for bait.
- Allowing female harvest would be backtracking on the little progress that we have made.
- Has taken many schoolkids down to the beaches to monitor and tag crabs. It is a life changing experience for them. They learn about the ecosystem and they boost the economy during these trips. The economy is not just grinding up crabs. The feedback from the younger generations is that they are worried adults are failing them when it comes to conservation.

Matthew Sarver (DE, Delaware Ornithological Society)

- Agrees with Chris Bason's comments.
- Also acknowledges the work on the ARM model, but still has concerns.
 - In particular, concerned that there is not an inherent carrying capacity in the model. Thinks shifting baselines will be an issue as a result.
 - Also concerned that there are not other climate variables in the model like water temperatures that affect spawning, etc.
 - Threatened shorebirds and other declining species can be more seriously impacted by stochastic climate events.
 - Other birds nor other aquatic species that rely on horseshoe crabs are considered in the model.
- Concerned that there is high variance in last few years of population estimates for red knots. This is bad timing for quota changes when we are coming off several years of unreliable population estimates, due to effort changes related to COVID-19.
- Agrees that we need to ground truth the model with more years of data before using it for setting specifications, especially for female crabs.

Faith Zerbe (DE Riverkeeper Network)

- Is a scientist with the DE Riverkeeper Network, which has 26,000 members in the Delaware River watershed. Has been involved with spawning surveys over last 20 years.
- It is unfortunate that the hearings came up quickly at a busy time for people.
- Many people enjoy volunteering to help with crabs.
- Agree with comments about the fisheries – the fisheries the bait is used for are also crashing
- Allowing female harvest is not precautionary at this time, with the COVID years affecting data, egg density not being used in the model, and climate change effects on spawning.
- Does not support either of the options and thinks there should be a moratorium.
- It is outrageous to jeopardize strides we have made and recovery efforts.
- There should be an extension of the comment period.

**Delaware Hearing Attendance
Thursday, September 8, 2022**

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Kristen	Anstead			kanstead@asmfc.org
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Michael	Smith	Ocean View	Delaware	mike.smith@coastalpoint.com
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Jordan	Zimmerman			jordan.zimmerman@delaware.gov

Horseshoe Crab Draft Addendum VIII Public Hearings

Maryland Webinar Hearing

September 14, 2022

17 Public Participants

Commissioners: Mike Luisi (MD), Roy Miller (MD), Shanna Madsen (VA), Chris Wright (NOAA)

ASMFC & State Staff: Caitlin Starks (ASMFC), Kristen Anstead (ASMFC), Toni Kerns (ASMFC), Emilie Franke (ASMFC), Steve Doctor (MD)

Hearing Overview

- All comments provided were against harvest of female horseshoe crabs
- Two commenters preferred the no action option
- Attendees asked questions about why female harvest is being proposed. Staff explained that the Addendum was initiated to update the science that is used for management rather than a specific desire to modify harvest levels.

Public Comment Summary

Amelia Seaman (Annapolis, MD)

- Totally against harvesting females. Does not see how this would help the red knots or anything else
- We are so dependent on horseshoe crab blood for vaccinations and the medical field so we shouldn't risk the population by harvesting female crabs
- Only 2-3 eggs from each spawning female survive; I don't understand how the population will continue to increase if you harvest female crabs
- Crabs are still spawning after June 7, so they won't be protected by the season; you can be picking female crabs right off the beach so that is not a good time to start harvesting

Kurt Schwartz (Maryland Ornithological Society)

- The Maryland Ornithological Society supports the no action option.
- Perplexed by the general lack of transparency in terms of where the proposal to harvest female crabs came from. The public has not seen the data. Calling for a transparent publication on this.
 - Staff responded that the ARM Revision is published and the peer review was open to the public.

David Curson (Maryland, Audubon Mid-Atlantic)

- Against any increase in bait harvest of crabs in the Delaware bay, prefer the no action option
- It is disappointing to have recommendations based on a model that can't be reviewed; even though the conceptual model is public, the parameterization of the model is possibly faulty and the data may not be the best sources of data. There is reason to believe the model is faulty because we know the red knot reproduction and survival is dependent on crab egg density, and horseshoe crabs have increased in the Delaware bay, but red knots have not increased. The current estimate is around 45,000, which is only about half of the recovery target; it seems bizarre when red knots have not recovered and the red knot populations have dipped sharply to have an increase in harvest with females taken, which would reduce eggs on the beach.

Robin Todd (Maryland Ornithological Society)

- We need a simple explanation of how the ARM is forecasting allowable harvests of horseshoe crabs when their population and the numbers of red knots visiting the Delaware Bay are not increasing.

Maryland Hearing Attendance				
Thursday, September 8, 2022				
First Name	Last Name	City	State	Email
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Horseshoe Crab Draft Addendum VIII Public Hearings

Virginia Public Hearing

Chincoteague, Virginia

September 15, 2022

5 Public Participants

Commissioners: Shanna Madsen (VA)

ASMFC & State Staff: Caitlin Starks (ASMFC), Ethan Simpson (VA)

Hearing Overview

- One individual commented in favor of Option B
- Other participants were not sure which option was preferred given uncertainty about how each option would affect the state quota
- State staff noted that if female harvest were allowed, then Virginia would not benefit from the 2:1 offset provision that allows them to increase their quota of male horseshoe crabs

Public Comment Summary

- One harvester mentioned that when fishing with gillnets the horseshoe crabs are not targeted, they are bycatch. So even if they cannot keep the crabs as harvest, the crabs will likely still die in the process of removing them from the nets.
 - Gillnets cannot select for female or male crabs, so females would still die even if bait harvest is not allowed



September 30, 2022

Horseshoe Crab Management Board
Atlantic States Marine Fisheries Commission
1050 N. Highland Street, Suite 200 A-N
Arlington, VA 22201
comments@asmfc.org

VIA ELECTRONIC MAIL

Re: Draft Addendum VIII to the Horseshoe Crab Fishery Management Plan for Public Comment

Dear Members of the Horseshoe Crab Management Board:

I write on behalf of New Jersey Audubon and Defenders of Wildlife to urge you to reject Addendum VIII to the Horseshoe Crab Fishery Management Plan. Since the Board instituted the Adaptive Resource Management (“ARM”) Framework in 2012, red knot¹ abundance at Delaware Bay has fallen to historically low levels, and the U.S. Fish & Wildlife Service (“FWS”) has listed the species as “threatened” under the Endangered Species Act (“ESA”). Horseshoe crabs, too, remain severely depleted compared to historical benchmarks. These circumstances demand greater protections and a precautionary strategy. But Addendum VIII would instead weaken the protections currently in place. Among other harmful outcomes, the Addendum almost certainly would reinstate the female horseshoe crab bait harvest. Recognizing that neither red knots nor horseshoe crabs have recovered, the ARM Framework, until this proposal, has prohibited female harvest to protect the eggs on which the red knots rely.

Horseshoe crab eggs are critical to the red knot’s ability to survive its 9,000-mile migration from as far south as Tierra del Fuego and to breed successfully in the Arctic Circle. The importance of horseshoe crab eggs to red knot success has long been recognized by scientists, government agencies, and the Atlantic States Marine Fisheries Commission (“ASMFC” or “Commission”), and the overharvest of horseshoe crabs has been a primary cause of the red knots’ decline over the past three decades.

Nevertheless, despite the well-established link between horseshoe crab eggs and red knot survival and reproduction, Draft Addendum VIII proposes a starkly different version of reality. Through a combination of modeling defects and risk-prone decision-making, the revised ARM Framework now determines that the relationship between these species is scarcely perceptible, and that red knots would be virtually indifferent to the renewed harvest of female horseshoe crabs.

¹ In this document, “red knot” refers to the *rufa* subspecies.

As detailed in these comments and the attached expert reports by Dr. Kevin Shoemaker and Dr. Romuald Lipcius, this depiction of the relationship between horseshoe crab eggs and red knot demography is deeply flawed. Contrary to the conclusions represented in Draft Addendum VIII, adopting a new management approach that would enable resumption of the harvest of female horseshoe crabs at this juncture, when both red knots and horseshoe crabs are depleted, would harm red knots and present risks to the horseshoe crab population itself. Accordingly, the revised ARM Framework is not suitable for recommending horseshoe crab bait harvest quotas.

More specifically, the Board should reject Addendum VIII for reasons including but not limited to:

- **The revised ARM Framework errs in concluding that red knots are not highly dependent on horseshoe crabs at Delaware Bay.**
 - After flying thousands of miles, red knots arrive at Delaware Bay to renourish on horseshoe crab eggs. Under ideal conditions, red knots can double their body weight in less than two weeks. In the late 20th century, the peak count of red knots at Delaware Bay usually exceeded 40,000 and sometimes exceeded 90,000.
 - Horseshoe crabs were overharvested in the 1990s. In 2015, FWS listed red knots as “threatened” under the ESA and called horseshoe crab overharvest and corresponding egg depletion a “primary causal factor” in red knot decline. The peak red knot count has stayed below 13,000 for each of the past two years.
 - Despite this strong evidence of the importance of horseshoe crab eggs to red knots, the revised ARM Framework posits a weak link between the two species. By so doing, the revised ARM Framework subverts the premise of ASMFC’s management regime for the horseshoe crab fishery, which is to manage the horseshoe crab harvest for red knot recovery.
- **New analysis reveals significant technical flaws that make the revised ARM Framework unsuitable for managing the horseshoe crab harvest.**
 - The revised ARM Framework abandons the well-established understanding of the importance of horseshoe crab eggs to red knots in favor of an extreme, contrary reconstruction of the ecosystem that defies history and reality. Even if horseshoe crabs vanished entirely today, the revised ARM Framework’s computer model predicts that red knot abundance would remain stable on average or even increase over the next 50 years. The model clearly would not have predicted the decline of red knots that resulted from horseshoe crab overharvest in the 1990s, which discredits its usefulness in making projections that could help both species recover.
 - The revised ARM Framework also undermines sustainable management of horseshoe crabs. By miscalculating uncertainty, the horseshoe crab projection model generates artificially stable horseshoe crab population projections, when there actually exists a significant threat of decline.
 - The horseshoe crab population projections are significantly influenced by nonsensically high recruitment rates that were plugged in for years when recruitment was not measured empirically, thus further undermining the reliability of its projections.

- The horseshoe crab population model bears very little correlation even to the data that the model is based upon, raising significant additional doubt about its predictive power and usefulness.
- **The revised ARM Framework’s risk-prone assumptions and decisions are inappropriate, especially when a threatened species is at stake.**
 - Horseshoe crab demographic information, including size and sex ratio, strongly suggests that the species is not recovering and that a risk-averse management approach is required.
 - The Framework does not consider the availability of horseshoe crab eggs, which is the most direct measure of food resources for red knots. Analysis of horseshoe crab demographic trends indicates that egg production may be declining more than abundance estimates suggest.
 - The model finds a weak relationship between horseshoe crabs and red knots partly because it is based on data from years when both species had already declined rather than when the ecosystem was flourishing. Modeled projections of a depleted ecosystem offer no guidance on managing to achieve recovery of either red knots or horseshoe crabs.
 - The Framework does not assess whether Delaware Bay provides adequate food for Southern wintering red knots, which are especially dependent on horseshoe crab eggs.
 - The Framework would eliminate protective population thresholds that must be met prior to any female harvest, creating risks to red knots and horseshoe crabs and contravening stakeholders’ precautionary intent.
 - For population estimates, the model equally weights three surveys, despite stakeholders’ express preference—and ASMFC’s practice until now—to rely exclusively upon the model that is purpose-designed for counting horseshoe crabs. This results in artificially inflated horseshoe crab population estimates.
- **ASMFC has repeatedly excluded input from stakeholders and the broader public.**
 - In addition to its other flaws, the revised ARM Framework is based on a model that has never been released to the public. Analysis of even the limited information made available to the public to date indicates significant problems with the model, as discussed above. If the Board approves Addendum VIII now and the model is subject to public evaluation, new concerns and critiques will inevitably arise after the revised ARM Framework is already in use.
 - The ARM Subcommittee failed to solicit formal stakeholder input in this proceeding, in violation of its own procedures and past practice.
 - By designating Addendum VI the “No Action” alternative, the Board artificially narrowed its options to two addenda that would reinitiate the female horseshoe crab harvest, thus deciding the most important issue before the public comment period even began.

- **The flaws in the revised ARM Framework must be addressed now.**
 - The authority of ASMFC to deviate from the ARM Framework’s harvest quotas in the future is not a rationale for approving Addendum VIII based on a flawed modeling framework now. Prematurely approving Addendum VIII would set the stage for contentious and arbitrary decisions about annual quotas for years to come.
 - The authority of states to set lower quotas than ASMFC provides does not lessen the Board’s obligation to ensure that the revised ARM Framework is fully vetted and reflects stakeholder values.
 - Updating the revised ARM Framework’s model as new data become available will not correct its fundamental flaws, many of which—as explained in these comments—are apparent from expert reviews of even the limited data made publicly available to date.

- **Approving Addendum VIII would likely lead to a violation of the Endangered Species Act by ASMFC.**
 - The ESA requires a precautionary approach to protecting threatened species.
 - By reinitiating the bait harvest of female horseshoe crabs, ASMFC would commit “take” of red knots. ASMFC is responsible under the ESA for harvests conducted pursuant to the quotas it sets.
 - FWS’s purported “evaluation” of the revised ARM Framework merely repackages ASMFC’s modeling, with all of its flaws, and uses it to generate an unreliable conclusion regarding the impact of red knots. It therefore sheds no new light on the Board’s stewardship responsibilities or the Commission’s legal obligations.

The objections listed above are elaborated in the comments and expert reports that follow. Each objection is an independently sufficient reason to reject Addendum VIII. Collectively, they demonstrate that Addendum VIII is incompatible with the Board’s mandate to maintain the ecosystem integrity of Delaware Bay and to comply with the Endangered Species Act.

Respectfully submitted,

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I. THE REVISED ARM FRAMEWORK ERRS IN CONCLUDING THAT RED KNOTS ARE NOT HIGHLY DEPENDENT ON HORSESHOE CRABS AT DELAWARE BAY.

Each year, a population of red knots completes one of the most epic migrations in the animal kingdom. Starting from Tierra del Fuego at the southern tip of South America, the red knots fly more than 9,000 miles to their breeding grounds in the Arctic Circle. For most red knots, the final staging area before the Arctic Circle is Delaware Bay, where their stopover coincides with another ecological marvel: the spawning of millions of horseshoe crabs that emerge from the water and lay clusters of approximately 4,000 eggs, with the potential for an individual to lay more than 100,000 eggs over the course of several nights.² For red knots that have already flown thousands of miles at enormous physiological expense, the eggs provide essential replenishment, enabling a doubling of body mass in fewer than 14 days, versus 21 to 28 days at comparable stopovers where they eat clams and mussels.³ This unique resource fuels the duration of their journey and enhances breeding success in the Arctic.⁴

The abundance of red knots and horseshoe crabs at Delaware Bay as recently as the 1990s is almost unimaginable today. From 1981 to 2002, the peak red knot count in Delaware Bay usually exceeded 40,000 and twice surpassed 90,000.⁵ One participant in an aerial survey of shorebirds during that period described “lines of deposited horseshoe crab eggs set like mineral veins in smooth white marble, virtually an unlimited food supply.”⁶ In a single day, his survey tallied 62,000 red knots and 318,000 total shorebirds on just the New Jersey side of Delaware Bay.⁷

In the 1990s, increasing and unregulated horseshoe crab harvest by the bait and biomedical industries crashed the population of horseshoe crabs.⁸ Red knots, no longer able to rely on the irreplaceable horseshoe crab eggs, declined in tandem. ASMFC adopted a fishery management plan for horseshoe crabs in 1998 and instituted adaptive management in 2012. Since then, the female bait harvest has been prohibited. But the fate of horseshoe crabs remains highly uncertain, and red knots have continued to decline. Red knot peak counts that previously topped 90,000 have, for the past two years, languished below 13,000, including a record low of 6,800 in 2021. Twenty years have passed since the population topped a modest 33,000.⁹ Instead of these peak

² NOAA Fisheries, *Horseshoe Crabs: Managing a Resource for Birds, Bait, and Blood* (July 31, 2018), <https://www.fisheries.noaa.gov/feature-story/horseshoe-crabs-managing-resource-birds-bait-and-blood>.

³ Lawrence Niles et al., *Effects of Horseshoe Crab Harvest in Delaware Bay on Red Knots: Are Harvest Restrictions Working?*, 59 *BioScience* 153, 154 (2009); New Jersey Department of Environmental Protection, *Wildlife Populations: Red Knot 1-2* (2020), <https://www.nj.gov/dep/dsr/trends/wildlife-redknot.pdf>.

⁴ Sjoerd Duijns et al., *Body Condition Explains Migratory Performance of a Long-Distance Migrant*, 284 *Proceedings of the Royal Society of London B* 20171374, at 4-6 (2017).

⁵ FWS, *Rufa Red Knot Background Information and Threats Assessment* 100 tbl. 12 (2014) (excluding 1984-1985, when the survey was not conducted).

⁶ Pete Dunne, *Tales of a Low-Rent Birder* 10 (1986).

⁷ *Id.* at 13-14.

⁸ FWS, *Rufa Red Knot Background Information and Threats Assessment* 232 (“Evidence that commercial harvests caused horseshoe crab population declines in recent decades comes primarily from a strong temporal correlation between harvest levels . . . and population levels.”).

⁹ *Id.* at 100 tbl. 12 (for years 1981-2014); ASMFC, *Revision to the Framework for Adaptive Management of Horseshoe Crab Harvest in the Delaware Bay Inclusive of Red Knot Conservation (Draft for Board Review)* 155 tbl.

counts, the revised ARM Framework uses modeled estimates of the total number of red knots passing through Delaware Bay. While these modeled estimates face criticism for overrepresenting red knots' use of Delaware Bay, they have fallen as well, from as high as 152,900 in 1989, to an average of 77,000 per year for 1998-2001, to numbers in the 40,000s over the past several years.¹⁰

In 2015, FWS formally listed the red knot as a threatened species under the Endangered Species Act.¹¹ At the time of the listing, FWS cited several studies indicating that red knot abundance had declined, “probably sharply,” since the 1980s.¹² FWS found that “[r]educed food availability in Delaware Bay due to commercial harvest of the horseshoe crab . . . is considered a primary causal factor in red knot population declines in the 2000s.”¹³ Reduced food availability is a particular threat for the Southern wintering population of red knots, which is disproportionately reliant on the Delaware Bay staging area and which FWS views as “a bellwether for the subspecies as a whole.”¹⁴ According to FWS, “[R]educed food availability at just one key migration stopover area (Delaware Bay) is considered the driving factor behind the sharp decline in the Southern wintering population in the 2000s.”¹⁵

As FWS has stated, “Studies have shown red knot survival rates are influenced by the condition (weight) of birds leaving the Delaware Bay staging area in spring.”¹⁶ Research has also shown that, while red knots arriving relatively late to Delaware Bay were able to compensate by gaining weight at a higher rate, that was not the case in years with low horseshoe crab egg availability.¹⁷

Until now, the well-established link between horseshoe crabs and red knots has been the cornerstone of ASMFC's management of the horseshoe crab fishery at Delaware Bay. Addendum VIII would subvert that regime. While the proposed model nominally bases harvest quotas on red knot and horseshoe crab abundance estimates, it assigns an extremely weak correlation between the abundance of the two species. It thereby concludes that red knots would be essentially unaffected by the resumption of the female horseshoe crab bait harvest.

As explained below, Addendum VIII's baseline assumption—that increasing the horseshoe crab harvest would only marginally impact red knots at Delaware Bay—is unsupported. It relies on evaluating a limited dataset that omits years when the ecosystem flourished. (For example, its dataset about horseshoe crab abundance is drawn entirely from the last 20 years, after the crash

12 (2021) (“ARM Report”) (for years 2011-2020); Larry Niles, “2022 Delaware Bay Stopover Project Final Update-5 June 2, 2022,” *A Rube with a View* (June 15, 2022), <https://www.arubewithaview.com/2022/06/15/2022-delaware-bay-stopover-project-final-update-5-june-2022/> (for years 2021-2022).

¹⁰ FWS, *Rufa Red Knot Background Information and Threats Assessment* 101 tbl. 13; ASMFC, *ARM Report* 155 tbl. 12.

¹¹ FWS, “Endangered and Threatened Wildlife and Plants; Final Threatened Status for the Rufa Red Knot,” 79 Fed. Reg. 73,706 (Dec. 11, 2014). The listing became effective on January 12, 2015. *Id.* at 73,706.

¹² FWS, *Rufa Red Knot Background Information and Threats Assessment* 85. While FWS primarily analyzed red knot population trends within individual regions, it “note[d] a temporal correlation between declines at Tierra del Fuego and Delaware Bay.” *Id.* at 84.

¹³ 79 Fed. Reg. at 73,707.

¹⁴ FWS, *Draft Recovery Plan for the Rufa Red Knot* 13 (May 2021).

¹⁵ *Id.* at 14.

¹⁶ *Id.* at 25; FWS, *Rufa Red Knot Background Information and Threats Assessment* 254.

¹⁷ FWS, *Rufa Red Knot Background Information and Threats Assessment* 253.

of the horseshoe crab population and during a period when red knot abundance has been comparatively low.) And it suffers from modeling defects that, among other things, erroneously overstate the size and stability of the horseshoe crab population.

For these reasons and others detailed below, Addendum VIII is not a pathway for sustaining red knots, much less restoring a thriving ecosystem, nor does it honor the precautionary approach required when a threatened species is at stake. Instead, it risks a violation of ASMFC's legal obligations, including its obligation to avoid "take" of red knots under the ESA. The Board therefore should reject Addendum VIII and instead adopt adequate protections for horseshoe crabs and red knots at Delaware Bay.

II. NEW ANALYSIS REVEALS SIGNIFICANT TECHNICAL FLAWS THAT MAKE THE REVISED ARM FRAMEWORK UNSUITABLE FOR MANAGING THE HORSESHOE CRAB HARVEST.

As detailed in the following sections, the parties to this letter solicited independent expert reviews of the revised ARM Framework. These reviews reveal significant technical and methodological flaws that render the Framework unreliable for ASMFC management decisions.

For the first expert review, Dr. Kevin Shoemaker conducted an independent analysis of the horseshoe crab abundance and projection model that informs the revised ARM Framework. Dr. Shoemaker demonstrates that the Framework contains significant flaws that make it unsuitable for managing the horseshoe crab harvest. These flaws are especially alarming given the implications of the Framework for a threatened species such as the red knot. This section details many of Dr. Shoemaker's key findings, all of which are explained in more detail in the attached expert report.

At the outset, it is important to note that most of the components of the revised ARM Framework's model still have not been made available to the public. As a result, Dr. Shoemaker was unable to evaluate the components that link horseshoe crab abundance to red knot abundance or generate horseshoe crab harvest recommendations. Although Dr. Shoemaker was able to draw some conclusions about those aspects of the model, most of the analysis below necessarily focuses on the horseshoe crab model. As these comments proceed to discuss, the analysis that Dr. Shoemaker was able to conduct reveals severe issues concerning the reliability of the modeling. Nevertheless, Dr. Shoemaker's focus on the publicly available modeling information should not be interpreted to suggest that the unreleased components do not also contain significant flaws. To the contrary, given the flaws that are apparent in the information released to date, it is vital that *all* components of the model be subject to public evaluation before the Board takes any action to approve Addendum VIII.

A. The revised ARM Framework Is an Inappropriate Tool for Helping to Reverse the Decline and Promote the Recovery of Red Knots.

Considering that adaptive management is premised on the link between horseshoe crabs and red knots, the weakness of that link in the revised ARM Framework is breathtaking. By way of illustration:

- Dr. Shoemaker shows that, even if the horseshoe crab population in Delaware Bay completely collapsed to zero, the revised ARM Framework would predict that red knot abundance would remain stable or even increase over the next 50 years on average.¹⁸
 - Furthermore, “This simulation exercise makes it very clear that the REKN model used in the revised ARM would not be able to predict or explain the decline in the REKN population observed during the 1990s.”¹⁹ In other words, the model could not even have diagnosed the problem that it is supposed to solve.
- The data informing the revised ARM Framework actually show a negative correlation between female horseshoe crab abundance and red knot recruitment.²⁰ That is, according to the model, as female horseshoe crab abundance *increases*, red knot recruitment *decreases* on average.
- Due to the weak relationship between red knot and horseshoe crab abundance, it is not implausible that, with future updates to the revised ARM Framework, the relationship will disappear entirely or even become negative. Dr. Shoemaker observes that “[t]his outcome would pose an existential problem for the ARM framework There does not appear to be a contingency plan for this outcome.”²¹
- Whatever weak signal the model has detected in historical data appears to be overwhelmed by random noise. As Dr. Shoemaker explains, it is highly likely that the model’s “information about the HSC/REKN relationship would explain little if any of the variation in independent validation data.”²²

Due to the weak relationship between red knots and horseshoe crabs represented in the revised ARM Framework, it is unlikely that the model would outperform—much less significantly improve upon—a “null” model that entirely omits any effect of horseshoe crab abundance.²³ Yet it was impossible for Dr. Shoemaker to explore this key issue further because of the limitations on the materials made publicly available to date. Nevertheless, the concerns raised by the analysis that Dr. Shoemaker was able to perform are profound and call into question the revised ARM Framework’s utility to guide any decision-making about the status or management of the affected species.

In sum, while the revised ARM Framework nominally recommends harvest quotas based on the relationship between horseshoe crabs and red knots, it effectively decouples the fates of the two species, unjustifiably transforming the methodology and philosophy that underlie the management of this fishery. This is an independently sufficient reason for the Board to reject Addendum VIII.

¹⁸ Kevin Shoemaker, *Review of 2021 ASMFC ARM Revision 6-9 & fig. 1* (Sept. 2022) (“*Shoemaker Expert Report*”).

¹⁹ *Id.* at 8.

²⁰ *Id.* at 9 fig. 2.

²¹ *Id.* at 10.

²² *Id.* at 26.

²³ *Id.* at 25-26.

B. The Horseshoe Crab Population Simulation Model Does Not Properly Account for Uncertainty, Resulting in Artificially Stable Abundance Projections.

The revised ARM Framework profoundly underestimates uncertainty in the horseshoe crab recruitment rate, thereby calling into question its projections concerning the impact of harvest. As Dr. Shoemaker explains, the rate at which new recruits join the reproductive population “is the most consequential empirically fitted component of the HSC simulation model.”²⁴ Other components of the model, such as natural and biomedical mortality, are fixed values, but the recruitment rate is calculated based on data.

Dr. Shoemaker shows²⁵ that the model errs by conflating two distinct types of uncertainty: (i) natural, year-over-year variation and (ii) the potential that the model incorporates incorrect parameters (most importantly, the mean horseshoe crab recruitment rate). The model treats both types of uncertainty as natural, year-over-year variation, with the consequence that the abundance estimates regress to a mean. In other words, the variations cancel each other out, making the projected population appear highly stable. But if evaluated properly, parameter uncertainty would likely compound over time, yielding a very different picture of the population. For example, if average recruitment is actually lower than the rate used in the model, that uncertainty would *not* cancel out over time. Instead, the horseshoe crab population could be headed for a one-way decline. Notably, the revised ARM Framework accounts for the two types of uncertainty separately in the *red knot* projection model, suggesting that the modelers recognized the importance of that approach, but nevertheless they did not implement it when projecting horseshoe crab abundance.

The consequences of this error are significant for estimates of the population’s trajectory. Properly accounting for uncertainty, Dr. Shoemaker found that the horseshoe crab population faces a very real threat of declining well below levels acknowledged by the revised ARM Framework’s projection model. Notably, he used the same estimates of uncertainty as the revised ARM Framework (as well as the same values for natural mortality, biomedical mortality, etc.). All that changed in his analysis was the method of evaluating uncertainty. Dr. Shoemaker’s analysis²⁶ reveals that:

- Even under a scenario with *no* bait harvest, *no* biomedical mortality, and *no* discard mortality, the female horseshoe crab population has a 17.4% probability of declining below 4 million, and a 3.8% probability of declining below 3 million, over the next 50 years.
 - For comparison, 4 million is the lowest female abundance estimated for any year from 2003 to 2019 (the years upon which the model was based).
 - In contrast, by incorrectly accounting for uncertainty, the revised ARM Framework’s model does not project female abundance values below 4 million within the 95% confidence interval under optimal harvest scenarios, *including* bait harvest, biomedical mortality, and discard mortality.²⁷

²⁴ *Id.* at 12.

²⁵ The information in this paragraph is drawn from *Shoemaker Expert Report* 12-18 & figs. 3-4.

²⁶ Except where noted, these findings are presented in greater detail at *Shoemaker Expert Report* 15, 18 fig. 4.

²⁷ ASMFC, *Supplemental ARM Report* 35 fig. 15.

- Under a scenario in which horseshoe crabs are harvested for bait under the maximum quotas of 500,000 males and 210,000 females but are still *not* subject to biomedical or discard mortality, the female population has a 33% probability of declining below 4 million, an 11% probability of declining below 3 million, and a 2% probability of declining below 2 million, over the next 50 years.

Dr. Shoemaker concludes that, “if sources of error in the recruitment process are properly accounted for, the outlook for the HSC population in Delaware Bay is uncertain even in the absence of any harvest pressures.”²⁸ If the Board approves Addendum VIII, it would increase harvest pressure through a model that fails to properly account for the risk of a declining horseshoe crab population.

C. The Horseshoe Crab Projection Model’s Recruitment Estimates Are Strongly Influenced by Nonsensical, Unverified Estimates from the Virginia Tech Gap Years.

The revised ARM Framework’s conclusions are further undermined by its reliance on fantastical recruitment projections to fill in a key gap in actual population-monitoring data for horseshoe crabs. Of the three trawl surveys that inform the catch multiple survey analysis (“CMSA”) component of the framework, only the Virginia Tech survey measures primiparous (i.e., newly mature) females to provide an empirically based estimate of recruitment. Thus, the CMSA does not incorporate any direct measurement of recruitment during the 2013-2016 period when the Virginia Tech survey was not conducted. Instead, it indirectly estimates annual recruitment rates, but two of these estimates are many times higher than any estimate from years with direct observations. Since the average recruitment rate in the population projection model treats all of the estimates as equally valid—whether or not they were based on empirical observations or hypothetical estimates—the model’s estimated annual recruitment rate is heavily influenced by the nonsensical estimates from the Virginia Tech gap years.

To understand the impact of the nonsensical gap year estimates, first consider the years with empirically derived recruitment estimates. The average annual estimated recruitment for 2003-2012 was 1.2 million primiparous females. The average annual estimated recruitment for 2017-2019 was 1.9 million. Now consider the non-empirically derived gap year estimates. In 2013, the estimate was *9.6 million*—roughly eight times larger than the average over the previous ten years, and four times larger than the maximum annual estimate from that period.²⁹ In 2014, the estimate dropped to only two primiparous females across all of Delaware Bay, but the estimate is so uncertain that the upper limit of the confidence interval approaches infinity.³⁰ All told, the *average* estimate for the four Virginia Tech gap years was 4.2 million primiparous females, which is nearly *2 million* higher than the *maximum* ever estimated for any year with empirical observations.³¹

²⁸ Shoemaker Expert Report 17.

²⁹ ASMFC, *Supplemental Report to the 2021 Revision to the Adaptive Resource Management Framework* 16 tbl. 3 (2022) (“*Supplemental ARM Report*”).

³⁰ *Id.* at 25 fig. 5.

³¹ *Id.* at 16 tbl. 3.

The nonsensical estimates from the Virginia Tech gap years compromise the horseshoe crab projection model because they significantly affect its recruitment estimate. As Dr. Shoemaker shows,³² in the original ARM report, the ARM Subcommittee based the recruitment rate exclusively on data from 2013 to 2019, which relied overwhelmingly on estimates from the gap years and generated an annual recruitment estimate of 3.1 million primiparous females. Following criticism from the Peer Review Panel, the Subcommittee expanded the dataset to include 2003-2019, which reduced the recruitment estimate to 1.67 million. But if the nonsensical data from the gap years were excluded, this estimate would fall to 1.26 million. Dr. Shoemaker illustrates how the difference in these estimates has huge implications for the model's projection of future horseshoe crab abundance.

Dr. Shoemaker concludes that “the inflated estimates of recruitment during the VT gap years are likely to be an artifact of the CMSA model specification (and the lack of data on recruitment for those years) and are unlikely to be reflective of true HSC recruitment rates. . . . [A] conservative (precautionary) approach would be to exclude the VT gap years when computing recruitment for the HSC population simulations.”³³ Doing so would yield a substantially lower recruitment estimate with a commensurately lower capacity to withstand a resumption of female harvest.

D. The Horseshoe Crab Population Model Has a Poor Correlation to Existing Data.

The CMSA's usefulness is cast further into doubt by its failure to correlate with any source of data about horseshoe crab abundance. As Dr. Shoemaker shows from an analysis of female horseshoe crab abundance estimates, the model does not correlate even with the data sources upon which it was based, much less any independent validation data.

For the years 2003-2019, the CMSA's correlation with the Delaware Adult Trawl Survey is extremely weak, and any correlation that exists is entirely attributable to the model's apparent ability to predict that horseshoe crab populations rose during 2013-2016, when the Virginia Tech survey was not conducted.³⁴ For the years before and after the Virginia Tech gap—that is, for the vast majority of years evaluated—the coefficient of determination (R^2) between the CMSA model and the Delaware Survey was *negative*, meaning that the model performed worse than a null model. The CMSA performs almost as poorly against data from the New Jersey Ocean Trawl Survey, with a weak positive correlation for the years prior to the Virginia Tech gap and a negative R^2 for the years after. The CMSA's worst performance comes when measured against the Virginia Tech survey, with a negative R^2 across the full time series for which data are available. To test the CMSA against independent validation data, Dr. Shoemaker compared it to the results of Delaware Bay spawning surveys and found no detectable relationship whatsoever between the results.

As this summary makes clear, the CMSA's modeled outcomes bear little relationship to actual data on the Delaware Bay horseshoe crab population. For this reason, Dr. Shoemaker recommends comparing the CMSA's horseshoe crab estimates to a null model that omits all information about horseshoe crab harvest from the model fitting process. Given its poor fit to

³² The data discussed in this paragraph can be found at *Shoemaker Expert Report* 22-24 & fig. 7.

³³ *Id.* at 23.

³⁴ The findings in this paragraph are presented in greater detail at *Shoemaker Expert Report* 19-22 & figs. 5-6.

existing data, the CMSA’s horseshoe crab projection model is “unlikely to outperform” even a relatively simple null model.³⁵ Dr. Shoemaker concludes, “If the HSC simulation model fails to outperform a model in which population dynamics are driven by noise instead of harvest, it should prompt managers to acknowledge that our current understanding of the effects of harvest on HSC populations remains insufficient for robust forecasting.”³⁶ Absent a sound basis for robust forecasting, adoption of Addendum VIII and its attendant resumption of the female harvest cannot be justified.

III. THE REVISED ARM FRAMEWORK’S RISK-PRONE ASSUMPTIONS AND DECISIONS ARE INAPPROPRIATE, ESPECIALLY WHEN A THREATENED SPECIES IS AT STAKE.

In addition to its technical flaws, the revised ARM Framework incorporates risk-prone assumptions and decisions that further render it unsuitable as a management tool. It neglects important variables related to horseshoe crab demography and egg density that cast doubt upon the recovery of horseshoe crabs and their ability to provide adequate food resources for red knots. It draws conclusions from data collected when both red knots and horseshoe crabs were already depleted and therefore does not understand how the species would interact in a healthy ecosystem. It also reverses precautionary decisions made by stakeholders in the original ARM Framework—without soliciting renewed stakeholder input—in order to eliminate protections against the female horseshoe crab harvest and utilize previously-rejected surveys that inflate horseshoe crab abundance estimates.

The findings in this section draw heavily from an independent analysis of the revised ARM Framework and related materials conducted by Dr. Romuald Lipcius, as well as the analysis of Dr. Shoemaker. Both expert reports are attached.

A. Demographic Trends Indicate that the Horseshoe Crab Population Is Not Recovering.

Despite the Subcommittee’s assertion that horseshoe crab abundance is increasing in Delaware Bay, Dr. Lipcius has identified troubling indicators that are inconsistent with a recovering population. The revised ARM Framework ignores these trends and treats abundance estimates as a comprehensive indication of population health. That would be a risk-prone approach even if the abundance estimates were fully reliable (which they are not).

As shown in Dr. Lipcius’s report, the mean size (prosomal width) of female horseshoe crabs has recently declined. In the most recent three years of available data (2018-2020), adult female horseshoe crabs recorded the lowest mean sizes of any year since data collection began in 2002.³⁷ The same is true for newly mature females over the most recent two years of available data.³⁸

³⁵ *Id.* at 25.

³⁶ *Id.*

³⁷ Romuald Lipcius, *Expert Report 6* (Sept. 2022) (“*Lipcius Expert Report*”).

³⁸ *Id.*

Dr. Lipcius explains that, given constant recruitment, a prohibition on female harvest would typically lead to an increase in size due to reduced harvest pressure on older, larger females.³⁹ The declining size of female horseshoe crabs is inconsistent with the premise that the female segment of the population has recovered.⁴⁰ It is further evidence that the revised ARM Framework does not properly account for the population dynamics of horseshoe crabs.

A female harvest prohibition would also be expected to decrease the ratio of males to females in the population. But the data indicate that the male-to-female ratio increased between 1999 and 2019, suggesting *fewer* females for every male.⁴¹ This is another warning sign that the population has not recovered, and the harvest of female horseshoe crabs should not resume.⁴² Resuming such harvest would only further deplete a critical component of the population that has failed to show expected signs of recovery even under the female harvest prohibition.

Abundance data for immature and newly mature females raise additional concerns about the recovery of the female population. In 2019 and 2020, the Virginia Tech survey estimated the lowest abundance of newly mature female horseshoe crabs since data collection began in 2002, “indicating low influx of young mature females into the spawning stock.”⁴³ Moreover, abundances of immature females and males for 2016-2020 were similar to those before 2013, when there was no female harvest prohibition in place. That is again contrary to expectations, since a prohibition on harvesting females should correlate to an increase in younger individuals.⁴⁴

Dr. Lipcius explains that estimates of abundance can be less sensitive to serious problems in a population than variables including female size, female size structure, spawning stock biomass, and sex ratio. But the revised ARM Framework relies on abundance estimates to the exclusion of these other important variables. That is a risk-prone strategy and is not suitable for protecting horseshoe crabs or the threatened red knots.

B. The Revised ARM Framework Fails to Consider Horseshoe Crab Egg Density, the Most Direct Measure of Food Availability for Red Knots.

Another critical omission in the revised ARM Framework is its exclusion of data about the most direct measure of the adequacy of food resources for red knots: the availability of horseshoe crab eggs on the beach. As explained above, for red knots arriving at Delaware Bay after flying thousands of miles, horseshoe crab eggs provide energy-rich, easily digestible nutrition as the birds prepare to complete their journey northward and breed in the Arctic Circle. Red knots flying from South America shrink their digestive organs for the journey, and no other food source can replace easily digestible horseshoe crab eggs in enabling red knots to quickly rebuild their organs and muscles.⁴⁵ When conditions permit, a red knot at Delaware Bay can double its

³⁹ *Id.*

⁴⁰ *Id.*

⁴¹ *Id.* at 10.

⁴² *Id.*

⁴³ *Id.* at 6, 7 fig. 1.

⁴⁴ *Id.*

⁴⁵ Niles et al., *Effects of Horseshoe Crab Harvest* 154.

body mass in as little as 12 days by feasting on horseshoe crab eggs.⁴⁶ Research indicates that the red knots that have flown the farthest, from Tierra del Fuego, are particularly dependent on the density of horseshoe crab eggs (i.e., the number of eggs per square meter of beach).⁴⁷ Nevertheless, the revised ARM Framework has failed to consider actual data on egg density in the Delaware Bay region. Whatever concerns may have existed about such data at the time the original ARM Framework was developed, egg density should now be considered in light of new scholarship (discussed below) and the importance of horseshoe crab eggs for red knots. The revised ARM Framework’s failure to do so represents another key flaw.

1. Egg density is the most direct measure of food availability for red knots.

Scientific studies link food availability at Delaware Bay to red knot survival and fecundity. Under favorable conditions including abundant horseshoe crab eggs, red knots at Delaware Bay roughly double their body mass from 90-120 grams to 180-220 grams before departing for the Arctic.⁴⁸ Individual red knots can gain up to 15 grams per day, “probably when horseshoe crab eggs are superabundantly available,” allowing even late-arriving red knots to gain adequate mass in a brief period.⁴⁹ Researchers have observed that red knots experience “striking fitness consequences . . . correlated with the amount of nutrient stores accumulated in Delaware Bay.”⁵⁰ Specifically, research has found a positive correlation between the mass of birds leaving Delaware Bay in the spring and the speed at which they complete their migration to the Arctic, reproductive success, and survival to the autumn.⁵¹

A superabundance of horseshoe crab eggs is required to meet the nutrition needs of red knots, other shorebirds, and the many other species that rely on this unique resource. Horseshoe crabs lay eggs too deep in the sand for red knots to access. But as more horseshoe crabs spawn on the beach, they disturb the sand, churning some of the eggs closer to the surface.⁵² It is this churning, as well as wave action, that makes horseshoe crab eggs accessible to red knots.⁵³ The system depends on the successive spawning of large numbers of horseshoe crabs.⁵⁴

2. Egg Density Has Declined Dramatically in Recent Decades, Correlating with the Decline in Red Knots.

Research strongly demonstrates that the abundance of horseshoe crab eggs near the beach surface (where the eggs are accessible to red knots) used to be at least ten times greater than the

⁴⁶ New Jersey Department of Environmental Protection, *Wildlife Populations: Red Knot* 1-2.

⁴⁷ FWS, *Species Status Assessment Report for the Rufa Red Knot* (Version 1.1) 9 (Sept. 2020) (“*Species Status Assessment Report*”).

⁴⁸ Allan J. Baker et al., *Rapid Population Decline in Red Knots: Fitness Consequences of Decreased Refuelling Rates and Late Arrival in Delaware Bay*, 271 *Proceedings of the Royal Society of London B* 875, 876 (2004).

⁴⁹ *Id.* at 876.

⁵⁰ *Id.* at 881.

⁵¹ Duijns et al., *Body Condition Explains Migratory Performance* 5-6.

⁵² Niles et al., *Effects of Horseshoe Crab Harvest* 155.

⁵³ *Id.*

⁵⁴ *Id.*

abundance in recent years.⁵⁵ Measurements from 1985 to 1987 conservatively indicate that egg density averaged 156,000 eggs per square meter of beach. In recent years, egg density averaged only around 10,000 eggs per square meter of beach.⁵⁶

This decline in egg density correlates with the dramatic decline of migratory shorebirds, especially red knots. The trends mirror each other over decades but also converge on smaller timescales. Among years when measurements were taken, the nadir for horseshoe crab egg density appears to have been the early 2000s, shortly after the unregulated overexploitation of horseshoe crabs in the 1990s.⁵⁷ This corresponds to a “changepoint” for red knots when the peak count dropped from more than 43,000 to fewer than 16,000.⁵⁸

3. Horseshoe Crab Abundance Is Not an Adequate Proxy for Egg Availability.

Notwithstanding the research documenting a dramatic decline in the availability of horseshoe crab eggs, the revised ARM Framework posits that the abundance of female horseshoe crabs is increasing. That is a dubious claim, as explained in section III.A of these comments. But even assuming for the sake of argument that it were correct, it would not necessarily result in more eggs for horseshoe crabs. To the contrary, demographic trends suggest that the production of eggs per horseshoe crab is likely decreasing.

Dr. Lipcius describes how egg production is directly proportional to the weight of horseshoe crabs, such that heavier crabs produce more eggs.⁵⁹ Data from the Virginia Tech Horseshoe Crab Trawl Survey indicate that the average prosomal width of female horseshoe crabs has fallen considerably, with an especially marked drop in the largest crabs over the past few years (2018-2020). Weight is an exponential function of prosomal width, meaning that even a modest decline in crab width could signify a very significant decline in weight and therefore in egg production. The trend toward smaller female horseshoe crabs may partially explain the low egg density numbers in recent years. Dr. Lipcius concludes that “total reproductive (egg) output has likely not improved, which hampers recovery of the HSC and RK populations.”⁶⁰

4. The ARM Report Presents No Compelling Reason to Ignore Egg Density.

There is no defensible rationale for completely excluding from the revised ARM Framework any direct measure of the most direct indicator of the adequacy of the red knot food supply: egg density. None of the ARM Subcommittee’s reasons for excluding data about food availability withstands scrutiny.

⁵⁵ Joseph A.M. Smith et al., *Horseshoe Crab Egg Availability for Shorebirds in the Delaware Bay: Dramatic Reduction After Unregulated Horseshoe Crab Harvest and Limited Recovery After 20 Years of Management*, Aquatic Conservation: Marine and Freshwater Ecosystems (2022) (in press) (“*Horseshoe Crab Egg Availability*”).

⁵⁶ *Id.*

⁵⁷ *Id.*

⁵⁸ *Id.*

⁵⁹ The information in this paragraph is drawn from *Lipcius Expert Report* 7-10 & figs. 2-6.

⁶⁰ *Id.* at 10.

First, the Subcommittee asserted that the protocol for measuring egg density over the years was too variable to provide reliable comparisons.⁶¹ Even if that was previously a legitimate concern, scientists have now demonstrated a long-term reduction in the surface availability of horseshoe crab eggs based on multiple studies using similar methods and sampling from comparable or even identical locations.⁶² More fundamentally, in the context of a threatened species, major warning signs should not be disregarded on the basis of uncertainty in the data, especially when the data that exist point strongly in the same troubling direction. As Dr. Lipcius explains, “Lack of use of HSC egg density data, as a proxy for RK food availability, amounts to a failure to incorporate all available scientific information into the analysis to guide management decisions in a risk-averse manner.”⁶³

The Subcommittee next asserted that habitat loss had not been “adequately rule[d] out” as the cause of declining egg density. This argument is equally misplaced. Recent research demonstrates that egg density has declined even where habitat continues to be suitable, such as where sand depth exceeds 40 centimeters.⁶⁴ Moreover, habitat loss does not provide a basis for disregarding the availability of horseshoe crab eggs for red knots. As Dr. Lipcius explains, while the Board does not have control over all sources of stress on horseshoe crabs, the existence of multiple stressors demands a *more* risk-averse approach with respect to factors such as harvest quotas that are fully within the Board’s control.⁶⁵

In addition, the Subcommittee denied the ability to link horseshoe crab egg abundance with red knot nutrition or survival.⁶⁶ However, as shown above, there is a strong correlation between declining egg density and declining red knot abundance.

Regardless of the Subcommittee’s concerns that egg density data are not sufficiently conclusive, or that habitat loss is a contributing factor, multiple studies over several decades uniformly point in the same direction: egg density has declined to an alarming degree, as have the red knots that consume the eggs. At a minimum, the Commission must recognize that plentiful eggs are a necessary and critical element of red knot recovery and solicit formal stakeholder input on incorporating that principle into harvest decisions in light of recent research.

C. The Revised ARM Framework Finds a Weak Relationship Largely Because It Relies on Data from Years When Both Red Knots and Horseshoe Crabs Were Already Depleted.

In contrast to all of the scientific information discussed above demonstrating a critical connection between horseshoe crabs and red knots, the revised ARM Framework finds a weak link between these species partly because it is based entirely on data from after the ecosystem

⁶¹ ARM Subcommittee, *Majority Response to Niles and Justification for Why Opinion Not Adopted* (in *ASMFC, ARM Report*) 105-06.

⁶² Smith et al., *Horseshoe Crab Egg Availability*.

⁶³ *Lipcius Expert Report* 12.

⁶⁴ Smith et al., *Horseshoe Crab Egg Availability*.

⁶⁵ *Lipcius Expert Report* 13.

⁶⁶ ARM Subcommittee, *Majority Response to Niles* 104.

crashed in the late 1990s.⁶⁷ The most the model can do is interpret the interaction between two perilously depleted species, without any concept of how a healthy ecosystem would function. In defiance of historical and scientific evidence, the revised ARM Framework seems to assume that a supposedly minimal correlation between horseshoe crabs and red knots when both species are degraded is indicative of how the ecosystem would operate when both species are plentiful. Rather than viewing its finding of a weak link appropriately as a symptom of an ailing ecosystem, the revised ARM Framework leverages it to justify greater exploitation.

As one example of why recent data may not represent the historic relationship between the two species, consider the population of red knots migrating from southern South America. These birds travel the farthest to reach Delaware Bay and need to rebuild their digestive organs upon arrival, making them particularly dependent upon easily digestible horseshoe crab eggs.⁶⁸ Even more than other red knots, this Southern wintering population has suffered “sharp and well-documented declines” in recent decades due to reduced food availability at Delaware Bay.⁶⁹ As a result, the relatively small number of red knots that pass through Delaware Bay may be increasingly skewed toward birds that winter farther north, with fewer of the birds that most heavily depend upon horseshoe crab eggs. The revised ARM Framework would interpret these conditions to mean that red knot abundance is less affected by horseshoe crab abundance and that greater exploitation is acceptable. It would thus ignore the impact of egg scarcity on the most vulnerable population of red knots.

While the revised ARM Framework may necessarily be limited by the years from which data are available, it should not draw overbroad conclusions from a constrained dataset. As Dr. Shoemaker explains, these constraints give the model a “limited scope of historical variation Using these models to forecast system dynamics under conditions outside the range of values used to fit the model (e.g., lower HSC abundances, higher REKN abundances) therefore requires extrapolation, which can be highly uncertain (and often inaccurate).”⁷⁰ Based on Dr. Shoemaker’s expert judgment, “[I]t does not seem prudent to implement management ‘experiments’ that could potentially imperil a threatened or endangered species (TES), even under the rubric of adaptive management.”⁷¹

D. The Revised ARM Framework Would Arbitrarily and Unjustifiably Remove Abundance Thresholds Below Which the Harvest of Female Horseshoe Crabs Is Prohibited.

The revised ARM Framework would arbitrarily lift the protective abundance thresholds intended to preserve the availability of food for red knots. Specifically, under the existing Framework, the female harvest quota is zero until the estimated abundance of female horseshoe crabs exceeds 11.2 million or the estimated abundance of red knots exceeds 81,900 in Delaware Bay.⁷² These

⁶⁷ *E.g.*, *ARM Report* 156 tbl. 13 (illustrating that the catch multiple survey analysis for horseshoe crabs uses data starting from 2003). Compounding the chronological limitations on the data informing the model, the revised ARM Framework also imposes geographic constraints by including only data from Delaware Bay.

⁶⁸ FWS, *Species Status Assessment Report* 9.

⁶⁹ *Id.* at 28; FWS, *Draft Recovery Plan for the Rufa Red Knot* 14.

⁷⁰ *Shoemaker Expert Report* 11.

⁷¹ *Id.*

⁷² ASMFC, *ARM Report* 21.

thresholds reflect stakeholders' desire to take a precautionary approach to managing the delicate relationship between horseshoe crabs and red knots. Because neither species has reached its threshold since the original ARM Framework was implemented, the model has never recommended a female harvest. Under the revised ARM Framework, the model could (and likely would) recommend a significant female harvest even when neither red knot nor female horseshoe crab abundance has exceeded its protective threshold. Indeed, the Subcommittee's calculations show that the model would have recommended a female harvest of approximately 150,000 for 2017-2019, years when the original ARM Framework recommended a female harvest of zero.⁷³

1. ASMFC Has Provided No Defensible Rationale for Removing the Protective Thresholds.

Removal of the protective thresholds received significant criticism in the minority opinions submitted by ARM Subcommittee members.⁷⁴ In rejecting these critiques, the Subcommittee relied on two primary arguments, neither of which is defensible.

First, the Subcommittee stated, "The presence of these threshold constraints in the utility function was criticized during this revision for not being consistent with adaptive management and optimization procedures and therefore they were removed from the utility functions."⁷⁵ But the Subcommittee's argument assumes that stakeholder values have no role in adaptive management, and that adaptive management is inconsistent with any constraint that arises from something other than an optimization model. This view squarely defies the adaptive management process as described in Addendum VII, which highly values stakeholder input, as explained in section IV.B of these comments. Moreover, the Subcommittee's view is internally inconsistent, as the revised ARM Framework appropriately maintains precautionary limits on the maximum harvest of male and female horseshoe crabs,⁷⁶ which represents a constraint on the model in deference to precautionary values. Thus, the revised ARM Framework is arbitrarily selective about its willingness to consider precautionary constraints.

Second, the Subcommittee described the thresholds as a "knife-edge utility function[]" and stated that, once the thresholds were exceeded, the existing ARM Framework would immediately recommend the maximum harvest package, with its female quota of 210,000.⁷⁷ According to the Subcommittee's calculations, the model is unlikely to ever select the interim harvest package, with a female quota of 140,000.⁷⁸

The Subcommittee's argument misses the mark. The immediate issue is whether female harvest is allowed *below* the thresholds. The Subcommittee may have concerns about what

⁷³ ASMFC, *Supplemental ARM Report* 21 tbl. 11.

⁷⁴ E.g., Wendy Walsh, *Walsh Minority Opinion* (in ASMFC, *ARM Report*) 113-14.

⁷⁵ ARM Subcommittee, *Majority Response to Niles* 107.

⁷⁶ ASMFC, *ARM Report* 81 ("[O]ne feature from the packages used in the original ARM version was retained: the maximum harvest for females was set to 210,000 and for males 500,000."). The Subcommittee pointed to these limits as an example of maintaining an "earlier decision[] made by stakeholders." ARM Subcommittee, *Majority Response to Walsh and Justification for Why Opinion Not Adopted* (in ASMFC, *ARM Report*) 125.

⁷⁷ ARM Subcommittee, *Majority Response to Walsh* 124.

⁷⁸ *Id.*

recommendations the current model would make in the unprecedented event that the thresholds were exceeded, but that is a separate question. In addition, if the current model would catapult over the interim harvest package and immediately recommend the maximum harvest package in the event that red knots or female horseshoe crabs met their abundance threshold, that would seem to indicate a defect in the existing model. A more reasonable correction would be to adjust the existing model to facilitate a gradual increase in female harvest recommendations once an abundance threshold is met. It is not at all clear why removing the thresholds altogether is a necessary or logical solution. Regardless, a potential defect in the current model's response to the achievement of protective thresholds for horseshoe crabs or red knots cannot offer any justification for eliminating the thresholds well before they are met. At the very least, the Subcommittee should have made its decision in consultation with stakeholders, not unilaterally.

2. The Elimination of the Protective Thresholds Illustrates the Improper Exclusion of Stakeholder Input.

In section IV.B, these comments detail why the exclusion of formal stakeholder input from the development of the revised ARM Framework was inappropriate and violated the requirements for adaptive management. This section explains why excluding stakeholders from decisions about the protective thresholds was particularly improper and contravened the views of the Commission's own experts and peer review panel.

During the Board's early consideration of developing Addendum VIII, the ARM Subcommittee Chair explained what process would be required to change (much less eliminate) the protective thresholds:

[M]oving forward with this new Population Dynamics Model, where that threshold is at 11.2 million, you know that could change. It is a possibility to have a different utility function. *That is something that would have to be discussed amongst stakeholders* and among the ARM Workgroup members.⁷⁹

Despite the Chair's acknowledgement that changing the female horseshoe crab threshold would require stakeholder input, the revised ARM Framework would eliminate the threshold even in the absence of stakeholder input.

The exclusion of stakeholders and elimination of the thresholds was criticized in the minority opinion of Subcommittee member (and Chair of the Delaware Bay Ecosystem Technical Committee) Dr. Wendy Walsh, the national lead for red knot recovery at FWS. Dr. Walsh meticulously detailed the role of stakeholder input in adaptive resource management and observed that the ARM Subcommittee had "failed to consult a broad array of stakeholders in the reinterpretation of previously agreed-upon objectives."⁸⁰ With respect to the abundance thresholds, Dr. Walsh explained:

⁷⁹ Comments of John Sweka, ARM Subcommittee Chair, *Proceedings of the Atlantic States Marine Fisheries Commission Horseshoe Crab Management Board 5* (Oct. 29, 2019) (emphasis added), <https://www.asmf.org/uploads/file/5fb2ea02HorseshoeCrabBoardProceedingsOct2019.pdf>.

⁸⁰ *Walsh Minority Opinion* 113.

These threshold values act as a constraint on female harvest, which was the express intent of the stakeholders. . . . [T]he formulation of these values as a constraint was an explicit and clear choice in the development of the existing framework. . . . [T]he high risk-aversion to female crab harvest by the stakeholders is clear, and thus it can be presumed that the new utility function . . . would be of considerable concern to those same stakeholders.⁸¹

The ASMFC-convened Peer Review Panel echoed these concerns. Recognizing that the Subcommittee had not convened stakeholders for this proceeding, the Panel tentatively stated that it “does not disagree” with the revised modeling functions, “as long as they truly reflect the objectives related to HSC harvest and REKN recovery and the risk associated with the HSC harvest.”⁸² The Panel reiterated its concern in its list of recommendations:

The new utility and harvest functions are a representation of values, and the Panel understands that convening a group of stakeholders for this revision was not possible. Therefore, the Panel recommends the WG fully consider whether the new utility and harvest functions represent stakeholder values as articulated in 2009.⁸³

The rejection of Dr. Walsh’s minority opinion indicated a troubling misunderstanding of the Subcommittee’s assignment. The Subcommittee wrote that retaining the threshold values “is more consistent with a simple harvest control rule” and “would not be adaptive management and would not require the Framework developed in this assessment.”⁸⁴ By this statement, the Subcommittee revealed that it viewed stakeholder input as an impediment to adaptive management—an obstacle to the Framework the Subcommittee had already devised. But as explained in more detail below in section IV.B, stakeholder input has consistently been recognized as the foundational step of adaptive management. There is no adaptive management without stakeholder input, and the revised ARM Framework is therefore not an exercise in adaptive management.

E. The Horseshoe Crab Population Estimates Are Improperly Based, in Large Part, on Two Surveys that Stakeholders Have Rejected.

The omission of stakeholder input was particularly harmful because it obscured stakeholder objections to new survey data upon which the revised ARM Framework extensively relies. Since its inception, the ARM Framework has based horseshoe crab abundance estimates entirely on data from the Virginia Tech Horseshoe Crab Trawl Survey, which reflected the original stakeholders’ greater confidence in that survey compared to other surveys of horseshoe crabs in Delaware Bay. The Virginia Tech survey is purpose-designed to count horseshoe crabs, as opposed to general surveys that count horseshoe crabs just incidentally, and FWS has called it

⁸¹ *Id.* at 113-14.

⁸² ASMFC, *Horseshoe Crab Adaptive Resource Management Revision Peer Review Report* (in ASMFC, *ARM Report*) 10 (277 of PDF) (“*Peer Review Report*”). Significantly, the Peer Review Panel’s tentative approval of the revised ARM Framework was uninformed by independent expert reviews such as those offered by Drs. Shoemaker and Lipcius in this comment process.

⁸³ *Id.* at 12.

⁸⁴ ARM Subcommittee, *Majority Response to Walsh* 122.

“the best benthic trawl survey to support the ARM.”⁸⁵ Yet the revised ARM Framework would drastically downgrade the model’s reliance on the Virginia Tech survey, rendering it one of three equally weighted surveys.⁸⁶ The two additional surveys that would comprise the abundance estimates—the New Jersey Ocean Trawl Survey and the Delaware Adult Trawl Survey—are general trawl surveys and not purpose-designed to count horseshoe crabs.

In her minority opinion, Dr. Walsh explained (as the Subcommittee acknowledged) that the revised approach would generate significantly higher abundance estimates,⁸⁷ which will lead to higher harvest recommendations for female horseshoe crabs. Dr. Walsh urged that, if the Subcommittee determined to rely upon all three surveys, it should at least accord greater weight to the Virginia Tech survey based on its “technical rigor and deliberate design” and “the high level of confidence that stakeholders have expressed in” it, among other reasons.⁸⁸ As Dr. Walsh noted, using all three surveys generates such high estimates that it would sometimes have resulted in female harvest recommendations even under the existing ARM Framework.⁸⁹

The original decision to rely exclusively on the Virginia Tech survey reflected explicit stakeholder input. By introducing two additional surveys that stakeholders previously disfavored, and weighting all three surveys equally, the revised ARM Framework alters yet another stakeholder-driven component of the model without soliciting formal stakeholder input.

IV. ASMFC HAS REPEATEDLY EXCLUDED INPUT FROM STAKEHOLDERS AND THE BROADER PUBLIC.

The development of Draft Addendum VIII omitted input from stakeholders and the public throughout the process. The Atlantic Coastal Fisheries Cooperative Management Act of 1993 requires the Commission to “provide[] adequate opportunity for public participation in the [fishery management] plan preparation process.”⁹⁰ ASMFC has violated legal requirements and its own guidelines by severely limiting public participation in this proceeding. Specifically, the Commission held a public comment period before essential information was publicly available, failed to solicit formal stakeholder input, and decided to artificially limit its range of options to adopting Addendum VIII or reverting to Addendum VI—both of which would lead to resuming the female horseshoe crab harvest—without any public input whatsoever.

⁸⁵ FWS, *Rufa Red Knot Background Information and Threats Assessment* 247.

⁸⁶ ASMFC, *ARM Report* 55.

⁸⁷ Walsh Minority Opinion 111; ARM Subcommittee, *Majority Response to Walsh* 123 (“[I]t was noted in the 2019 assessment that equally weighting the surveys resulted in higher population estimates and that characterization by Walsh is accurate.”); ASMFC, *Supplemental ARM Report* 21 tbl. 11 (for a comparison of abundance estimates under the current and proposed methodologies).

⁸⁸ *Walsh Minority Opinion* 111.

⁸⁹ *Id.* at 111-12.

⁹⁰ 16 U.S.C. § 5104(a)(2)(B).

A. ASMFC Held the Public Comment Period Before the Revised ARM Framework's Core Model Was Publicly Available.

The public comment period for Addendum VIII occurred while crucial, material information was being withheld from the public. Specifically, the public still has not been allowed to see the model that generates bait harvest recommendations for horseshoe crabs in Delaware Bay.

New Jersey Audubon and Defenders of Wildlife requested the model on February 23, 2022, in FOIA requests submitted to the U.S. Geological Survey (“USGS”) and FWS, as well as a record request submitted to ASMFC. While ASMFC provided certain components related to the horseshoe crab estimates, USGS controls the core component that links horseshoe crabs and red knots to generate harvest recommendations. In a letter prior to the Board’s August 2022 meeting, New Jersey Audubon and Defenders of Wildlife explained that USGS had not yet released the model and urged the Board not to initiate the public comment period on Draft Addendum VIII until the public could access the model that underlies the revised ARM Framework.⁹¹ At the Board meeting, several members expressed concern about the unavailability of the model, noted USGS’s stated intent to release the model following internal review,⁹² and asked to be kept apprised of developments in the public’s access to the model.

As of September 30, 2022—the close of the public comment period on Draft Addendum VIII—USGS has still not released the model. As a result, the public’s ability to submit substantive technical comments has been severely constrained. As this comment letter demonstrates, public evaluation is essential for identifying significant issues for the Board’s consideration. Indeed, many of Dr. Shoemaker’s critiques were enabled by the limited model components released by ASMFC. But the preponderance of the model underlying the revised ARM Framework still has not been subject to public evaluation. Dr. Shoemaker listed several questions that he could have investigated more thoroughly if that model were available,⁹³ including:

- Does the red knot projection model outperform a null model that excludes any effect of horseshoe crab abundance?
- How much variation in apparent survival in the red knot IPM model is explained by the horseshoe crab effect compared to random among-year variation?
- Would an index of horseshoe crab egg density explain more variation in red knot survival and fecundity than the CMSA-derived estimate of horseshoe crab abundance?

While the Board should resolve the issues that have already been raised before further considering Addendum VIII, it is impossible to anticipate all of the additional questions that will

⁹¹ Letter from Benjamin Levitan, Earthjustice, to ASMFC Commissioners re *Consideration of Draft Addendum VIII on the Implementation of Recommended Changes from 2021 Adaptive Resource Management Revision and Peer Review Report for Public Comment* (July 26, 2022).

⁹² In an email accompanying its denial of a Freedom of Information Act Request for the model, a U.S. Geological Survey representative wrote, “We have withheld the two USGS models, but they and their associated use publications will be published following the required USGS Fundamental Science Practices reviews.” Email from Janis Wilson, USGS, to Benjamin Levitan, Earthjustice, re: *FOIA: DOI-USGS-2022-002312 – Response* (July 28, 2022). On August 15, 2022, New Jersey Audubon and Defenders of Wildlife administratively appealed the denial of access to the model, but USGS has not yet responded.

⁹³ *Shoemaker Expert Report* 26-27.

be identified once the model is released. New issues will inevitably arise. The proper time to address those questions is before the Board approves Addendum VIII. Enabling the public to identify additional questions only after the revised ARM Framework has been approved would subject red knots and horseshoe crabs to unacceptable risk and raise difficult administrative questions about how to limit the harm even as the Framework is in place.

B. The Subcommittee Violated ASMFC's Procedures by Failing to Solicit Formal Stakeholder Input.

The ARM Subcommittee's failure to solicit formal stakeholder input in this proceeding violated the principles and process of adaptive management. When the Board first approved the ARM Framework in Addendum VII more than a decade ago, stakeholder input was integral to the process. The *first sentence* of the "ARM Framework" section of Addendum VII was, "A goal of the ARM Framework is to transparently incorporate the views of stakeholders along with predictive modeling to assess the potential consequences of multiple, alternative management actions in the Delaware Bay Region."⁹⁴ The ARM Subcommittee expressed the same sentiment about the "ARM approach" in the current proceeding: "First, there is a great emphasis on complete elicitation of objectives and management actions from a full range of stakeholders."⁹⁵ The Subcommittee took that sentence verbatim from the Commission's Framework for Adaptive Management from 2009,⁹⁶ demonstrating how consistently stakeholder input has been acknowledged as the cornerstone of adaptive management.

The Board formalized the role of stakeholder input when it approved Addendum VII, which implemented an adaptive management framework for the Delaware Bay horseshoe crab fishery. Addendum VII required that the ARM Framework's "[i]mplementation *shall* be comprised of two cycles."⁹⁷ The *first step* of the "Longer Term Cycle," which was to occur "every 3 or 4 years," was to "[s]olicit formal stakeholder input on ARM Framework to be provided to the relevant technical committees."⁹⁸

The ARM Subcommittee's failure to convene stakeholders in preparing Addendum VIII violated the Board's express requirements, as well as the principles underlying the adoption of adaptive management. And if the Board approves Addendum VIII, the exclusion of stakeholders is unlikely to be rectified anytime soon. Addendum VIII sets forth a default period of "every 9 or 10 years" for revising the ARM Framework, which "should incorporate" soliciting "formal stakeholder input."⁹⁹ Pursuant to that schedule, if the Board approves Addendum VIII in 2022—which it should not do—the ARM Framework will be due for a revision in the early 2030s. Assuming that stakeholders are formally consulted at that time (unlike this time), roughly 20

⁹⁴ ASMFC, *Addendum VII to the Interstate Fishery Management Plan for Horseshoe Crabs for Public Comment: Adaptive Resource Management Framework 2* (2012), https://www.asmfc.org/uploads/file/hscAddendumVII_Feb2012.pdf ("*Addendum VIII*").

⁹⁵ ASMFC, *ARM Report 21*.

⁹⁶ ASMFC, *Stock Assessment Report No. 09-02 (Supplement B): A Framework for Adaptive Management of Horseshoe Crab Harvest in the Delaware Bay Constrained by Red Knot Conservation 1* (2009), <https://www.asmfc.org/uploads/file/2009DelawareBayARMReport.pdf>.

⁹⁷ ASMFC, *Addendum VII* at 4 (emphasis added).

⁹⁸ *Id.*

⁹⁹ ASMFC, *Horseshoe Crab Draft Addendum VIII for Public Comment 8* (Aug. 2022).

years will have elapsed between such consultations, a striking contrast to the “3 or 4 year[]” interval required by Addendum VII. That would also mean that stakeholders would not be formally consulted for roughly *17 years* after FWS’s 2015 determination to list red knots under the Endangered Species Act. While it is impossible to know all the ways that soliciting stakeholder input would have affected the current proceeding, the revised ARM Framework’s elimination of the protective abundance thresholds (described above in section III.D.2) demonstrates that this concern is not merely theoretical.

It bears repeating how significantly the revised ARM Framework departs from the paradigm that the stakeholders accepted in preparation for Addendum VII, which instituted harvest recommendations based on the relationship between horseshoe crabs and red knots. The revised Framework would weaken that relationship almost to the point of nonexistence and recommend quotas accordingly. While presented as a technical update, the revised ARM Framework cannot plausibly be considered a reflection of the stakeholders’ articulated values. At the very least, stakeholders should have been involved in designing a revised approach. Failure to involve them represents another reason for rejecting the current proposal.

C. Even Before the Public Comment Period, ASMFC Purported to Limit Its Options to Those that Would Reinitiate the Female Horseshoe Crab Harvest.

In addition to the inaccessibility of crucial information and the exclusion of stakeholder input, there was no public notice or comment for arguably the most critical decision presented by Draft Addendum VIII, which ASMFC now presents as a foregone conclusion: designating a reversion to Addendum VI as the “No Action” alternative if the Board does not approve Addendum VIII.¹⁰⁰ Addendum VI would increase the Bay-wide horseshoe crab harvest quota and *allow for the resumption of the female harvest* in Maryland and Virginia. Thus, the Board has effectively foreclosed public comment on the pressing question of *whether* to resume female harvest for this fishery. Under the terms of draft Addendum VIII, whichever option the Board selects—and regardless of any information that might surface during the public comment period—that decision is preordained.

On the merits, selecting Addendum VI as the “No Action” alternative was arbitrary, unnecessary, and misleading. Addendum VI would completely transform the management framework. The transition from Addendum VI to Addendum VII was arguably the most significant event in ASMFC’s management of the horseshoe crab fishery, and reverting to Addendum VI would be equally significant.

To justify the selection of Addendum VI, Draft Addendum VIII indicates that Addendum VII is unavailable as the “No Action” alternative because the model underlying it was built on obsolete software and can no longer be utilized.¹⁰¹ Even if the software is obsolete, that does not back the Board into a corner with no option but to adopt an addendum with a female harvest. The current ARM Framework has generated the same harvest quota for ten consecutive years, and the legitimate “No Action” alternative would be to apply the same quota to the 2023 fishing season. In fact, Addendum VII contains two “fallback option[s]” for when the data required to run the

¹⁰⁰ *Id.* at 5.

¹⁰¹ *Id.*

ARM model are not available: use the quotas from Addendum VI *or* use the same quotas as the previous year.¹⁰² It is unclear why the Board would have fewer options when the Addendum VII model cannot be run. The natural understanding of “No Action” would be to maintain the current status quo—i.e., the current addendum and current quotas—not to revert to an addendum and quotas that mark a major departure from the status quo.

At the August 2022 Board meeting, ASMFC staff explained that simply reusing last year’s quotas is not appropriate because that would not qualify as “adaptive resource management.”¹⁰³ Even if that were so, the solution should not be to reinstate the 12-year-old static quotas from Addendum VI. If the Board has authority to impose such a drastic change, then surely it has authority to continue relying on the most recent outputs of the current ARM Framework. It may be that neither option offers a satisfactory long-term solution, but the question now is what to do while questions about the revised ARM Framework are being addressed. The Board is not required to rush through a new (or old) addendum. It can temporarily maintain the current Framework to allow for thorough consideration of the appropriate next step, which clearly does not include accepting Addendum VIII as currently proposed.

V. THE FLAWS IN THE REVISED ARM FRAMEWORK MUST BE ADDRESSED NOW.

The Board’s decision on Addendum VIII is highly consequential and could determine the course of the horseshoe crab fishery for many years to come. It is vital that the revised ARM Framework be subject to full vetting, and that foreseeable flaws be identified, prior to implementation by the Board. There will not be realistic opportunities to remedy defects in the revised ARM Framework in the future—at least not without imposing large burdens on both the Board and the public.

A. Flaws in the Revised ARM Framework Cannot Realistically Be Remedied at the Quota-Setting Stage.

At the Board’s meeting in August 2022, some speakers observed that Addendum VIII will not, in itself, set binding quotas because the Board will retain discretion to deviate from the ARM Framework’s harvest recommendations, and states will retain discretion to set quotas below those set by the Board.¹⁰⁴ But that is not a valid rationale for approving an addendum that has not been fully vetted and has been demonstrated to be flawed based on even the limited amount of information that has been made publicly available.

The purpose of the ARM process is to generate harvest recommendations based on rigorous science and sound policy.¹⁰⁵ As these comments detail, the revised ARM Framework incorporates many substantive and procedural flaws, and additional flaws are likely to emerge

¹⁰² ASMFC, *Addendum VII* at 6.

¹⁰³ ASMFC, *Horseshoe Crab Management Board Proceedings Aug2022*, at 5:11, <https://www.youtube.com/watch?v=OZvpdTTPj8c>.

¹⁰⁴ *E.g., id.* at 28:00, 1:12:57.

¹⁰⁵ 16 U.S.C. § 5104(a)(2)(B) (requirement in the Atlantic Coastal Fisheries Cooperative Management Act of 1993 for ASMFC to follow “standards and procedures to ensure that . . . [fishery management] plans promote the conservation of fish stocks throughout their ranges and are based on the best scientific information available.”).

when the underlying model is released to, and evaluated by, the public. Regardless of the Board's or states' ability to deviate from those recommendations, the Board must ensure that the Framework represents the best available—and properly vetted—science and policy. To do otherwise would call into question the purpose of the ARM process and the harvest recommendations.

It would also not be practical for the Board or states to resolve the flaws in the revised ARM Framework at the quota-setting stage. If Addendum VIII were approved and the Board were unable to rely upon the Framework's flawed harvest recommendations, there would be no clear criteria or guidelines for establishing quotas, leading to a confusing, burdensome, and arbitrary quota-setting process. Similarly, if the Board approved Addendum VIII and adopted the revised ARM Framework's flawed harvest recommendations, states would need to determine the proper course in the absence of reliable information or direction from ASMFC. That would undermine the Horseshoe Crab Fishery Management Plan's purpose of creating “[a] coordinated and consistent management strategy.”¹⁰⁶

B. Flaws in the Revised ARM Framework Cannot Be Addressed Through Updates to the Model.

While the revised ARM Framework can be “updated based on the annual routine data collected in the region,”¹⁰⁷ updates will not remedy its flaws. Many of the defects identified in these comments cannot be addressed by new data but rather demand a deeper restructuring of the model. For example, the model's miscalculation of the uncertainty in horseshoe crab abundance projections will persist despite new data. The same is true for all of the variables that are omitted from the model but indicate an unstable horseshoe crab population: egg density, prosomal width, sex ratio, etc.

Other defects would theoretically be alleviated by new data, but not on any relevant timescale. For example, the effect of the nonsensical horseshoe crab recruitment rates from the Virginia Tech gap years will gradually be diluted as new data are added, but they will continue to have perilously high influence for many years—realistically, for as long as Addendum VIII will be in effect. And even if, for the sake of argument, the estimated recruitment rate will slowly become more accurate over the years, that does not justify neglecting to fix a clear defect before implementing the revised ARM Framework.

Finally, some defects may be compounded by the addition of more data. As explained above in section III.C, the model is based entirely on data from when both horseshoe crabs and red knots had already crashed. It does not reflect the dynamics of a properly functioning ecosystem. As more data from the post-crash years are added, the model may only grow more confident that the current state of the ecosystem represents the norm. As Dr. Shoemaker observes, additional data may even yield a negative relationship between the abundance of horseshoe crabs and red knots, which would pose an existential problem for the Framework.¹⁰⁸

¹⁰⁶ ASMFC, *Fishery Management Report No. 32 of the Atlantic States Marine Fisheries Commission: Interstate Fishery Management Plan for Horseshoe Crab 1* (1998).

¹⁰⁷ ASMFC, *Draft Addendum VIII* at 8.

¹⁰⁸ *Shoemaker Expert Report* 10.

VI. APPROVING ADDENDUM VIII WOULD LIKELY LEAD TO A VIOLATION OF THE ENDANGERED SPECIES ACT BY ASMFC.

In addition to the other bases for rejecting Addendum VIII discussed above, the Endangered Species Act provides a powerful further reason: adopting Addendum VIII would threaten to violate the federal prohibition against “taking” a threatened species. The ESA prohibits any person from “tak[ing] any [endangered] species within the United States or the territorial sea of the United States.”¹⁰⁹ Such prohibited “taking” includes actions that “harm” listed species, including “significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.”¹¹⁰ The ESA’s “taking” prohibition extends to governmental authorization to take protected species that facilitates such harm by “solicit[ing]” or “caus[ing]” an offense.¹¹¹ By regulation, that prohibition extends to the taking of most threatened species, including the red knot.¹¹²

A. The Endangered Species Act Requires a Precautionary Approach.

In the Endangered Species Act, Congress adopted a precautionary approach. As the Supreme Court has stated, “Congress has spoken in the plainest of words, making it abundantly clear that the balance has been struck in favor of affording endangered species the highest of priorities, thereby adopting a policy which it described as ‘institutionalized caution.’”¹¹³ This principle is echoed in the ARM Framework’s objective statement, which calls for “*ensur[ing]* that the abundance of horseshoe crabs is not limiting the red knot stopover population or slowing recovery.”¹¹⁴ Within the context of the ESA’s legal framework, to ensure against such harms means taking a precautionary approach of “giv[ing] the benefit of the doubt to the species.”¹¹⁵ By setting ASMFC on a path to harm a threatened species whose population shows no sign of recovery, the revised ARM Framework would fall far short of ESA requirements and ASMFC’s own objective.

As shown above, in many instances, Addendum VIII would enshrine a risk-prone approach instead of the risk-averse, precautionary approach required under the ESA. Even as it would allow the renewed harvest of female horseshoe crabs, Addendum VIII would utilize a model that, among other risky decisions:

- rejects the significant connection between horseshoe crabs and red knots,

¹⁰⁹ 16 U.S.C. § 1538(a)(1)(B).

¹¹⁰ 50 C.F.R. § 17.3.

¹¹¹ *Strahan v. Coxe*, 127 F.3d 155, 163 (1st Cir. 1997); 16 U.S.C. § 1538(g).

¹¹² 50 C.F.R. § 17.31(a) (applying the provisions of § 17.21 (addressing endangered species) to threatened species); *id.* § 17.21(a), (c) (“[I]t is unlawful . . . to solicit another to commit or to cause to be committed” the taking of an endangered species.).

¹¹³ *Tenn. Valley Auth. v. Hill*, 437 U.S. 153, 194 (1978).

¹¹⁴ ASMFC, *ARM Report* 25 (emphasis added).

¹¹⁵ *See, e.g., Roosevelt Campobello Int’l Park Comm’n v. U.S. Envtl. Prot. Agency*, 684 F.2d 1041 (1st Cir. 1982) (quotations and citation omitted); *see also Defs. of Wildlife v. U.S. Dep’t of the Interior*, 931 F.3d 339, 351 (4th Cir. 2019) (same regarding scientific determinations).

- neglects egg-density data, which provide the most direct measure of the adequacy of food for red knots,
- rejects protective populations thresholds that were essential to the only group of stakeholders that ASMFC ever formally consulted about this matter,
- assumes that horseshoe crabs are recovering despite negative demographic trends, and
- uses horseshoe crab projections that fail to account for uncertainty and are scarcely more accurate than a null model.

The exclusion of public input at multiple stages of this proceeding exacerbates the risk of an ESA violation because ASMFC has evaded the public scrutiny that would be appropriate for such a consequential proceeding. A risk-averse approach would be to welcome public input in order to identify and address weaknesses that create unacceptable risk for the red knot. But the Board has taken a different, risk-prone approach: hastening a vote on Addendum VIII even as the underlying model continues to be withheld, despite record requests submitted more than seven months ago. The Board will therefore make a decision without the benefit of crucial public input and the important considerations such input would raise.

Both ASMFC and FWS suggest that the model will be improved by future updates.¹¹⁶ As shown above in section V.B, updates cannot remedy the flaws in the revised ARM Framework. But even if they could, relying on future updates is not appropriate when an ecosystem is dangerously degraded and a threatened species hangs in balance. Future updates are likely to come too late.

B. By Utilizing the Revised ARM Framework, ASMFC Would Harm Red Knots.

Like any other association or governmental entity, ASMFC is subject to the ESA taking prohibition.¹¹⁷ Under the Atlantic Coast Fisheries Cooperative Management Act of 1993,¹¹⁸ ASMFC’s fishery management plans are legally binding upon affected states. Once the Commission issues a plan, states “shall implement and enforce the measures of such plan within the timeframe established in the plan.”¹¹⁹ Because ASMFC’s quotas cannot be exceeded, states have been prohibited from authorizing female horseshoe crab bait harvest in Delaware Bay under the existing framework. States may authorize a female bait harvest only if ASMFC sets a non-zero female harvest quota.¹²⁰

¹¹⁶ ASMFC, *Draft Addendum VIII* at 8; FWS, *U.S. Fish and Wildlife Service Evaluation of the Atlantic States Marine Fisheries Commission Horseshoe Crab/Red Knot Adaptive Resource Management Revision* at 3 of PDF (2022) (“*Evaluation*”), <https://www.fws.gov/sites/default/files/documents/service-evaluation-of-atlantic-states-marine-fisheries-commission-horseshoe-crab-red-knot-adaptive-resource-management-revision.pdf>.

¹¹⁷ The ESA applies to any “person,” which is broadly defined. 16 U.S.C. § 1532(13) (“The term ‘person’ means an individual, corporation, partnership, trust, association, or any other private entity; or any officer, employee, agent, department, or instrumentality of the Federal Government, of any State, municipality, or political subdivision of a State, or of any foreign government; any State, municipality, or political subdivision of a State; or any other entity subject to the jurisdiction of the United States.”).

¹¹⁸ Atlantic Coastal Fisheries Cooperative Management Act of 1993, Pub. L. 103-206, 107 Stat. 2419, Tit. VIII (codified at 16 U.S.C. § 5101 *et seq.*).

¹¹⁹ *Id.* § 5104(b)(1).

¹²⁰ *Cf. Defs. of Wildlife v. U.S. Env'tl. Prot. Agency*, 882 F.2d 1294, 1301 (8th Cir. 1989) (EPA’s registration of pesticide effected a taking because the pesticide could not be used without such registration).

ASMFC's fishery management decisions therefore have a direct causal connection to the ultimate bait-harvesting actions that impact horseshoe crabs and red knots.¹²¹ Indeed, the connection between the Board's management decisions and red knot demographics is the premise and intent of the ARM Framework's objective statement:

Manage harvest of horseshoe crabs in the Delaware Bay to maximize harvest but also to maintain ecosystem integrity, provide adequate stopover habitat for migrating shorebirds, and ensure that the abundance of horseshoe crabs is not limiting the red knot stopover population or slowing recovery.¹²²

Draft Addendum VIII shows that, if the revised ARM Framework had been utilized in 2017-2019, it would have allowed for the harvest of around 150,000 female horseshoe crabs each year,¹²³ compared to the actual quota of zero for each of those years. Going forward, allowing such an increase in the harvest of female horseshoe crabs, upon which egg abundance depends, threatens significant degradation and modification of red knot habitat at Delaware Bay that would kill or injure red knots by significantly impairing breeding and feeding activities that are essential to the continued existence of the species.¹²⁴

As explained above, the revised ARM Framework raises serious questions that the Board has not answered or publicly considered. After 24 years of ASMFC management, including 10 years under an ARM Framework, neither red knots nor horseshoe crabs are on a trajectory to recover. There are serious reasons to doubt even the modest increase in the horseshoe crab population that ASMFC reports. ASMFC's red knot abundance estimates are essentially flat at low numbers, while other estimates based on direct counting have shown a dangerous decline in recent years.

Now, in the Board's first addendum since red knots were listed as threatened, Addendum VIII would result in the increased harvest of horseshoe crabs, including the resumed harvest of females, thus magnifying the factors imperiling red knots. This poses an enormous risk to the ecosystem, which is precisely the wrong response to a species being listed under the ESA.

C. FWS's "Evaluation" Does Not Offer Independent Support for Addendum VIII.

Recent statements from FWS do not bolster the credibility of the revised ARM Framework. When FWS listed red knots as threatened under the ESA, it stated, "[A]s long as the ARM is in place and functioning as intended, ongoing HSC bait harvests should not be a threat to the red knot."¹²⁵ In her minority opinion raising concerns about the revised ARM Framework, Dr. Walsh

¹²¹ *E.g.*, *Sierra Club v. Yeutter*, 926 F.2d 429, 438-39 (5th Cir. 1991) (holding that government agency violated ESA taking prohibition by authorizing logging that destroyed habitat and thereby impaired essential behavioral patterns of listed woodpecker species); *Loggerhead Turtle v. County Council of Volusia County*, 896 F. Supp. 1170, 1181-82 (M.D. Fla. 1995) (holding that county that regulates vehicular access to beaches is liable under ESA for taking of sea turtles caused by nighttime beach driving).

¹²² ASMFC, *ARM Report 25*.

¹²³ ASMFC, *Draft Addendum VIII* at 12 app'x A tbl. 1 (showing annual female harvest quotas ranging from 144,803 to 154,483).

¹²⁴ 50 C.F.R. § 17.3 (defining "[h]arm").

¹²⁵ 79 Fed. Reg. at 73,709.

wrote that “[i]mmediate resumption of female harvest by the means described in the draft report may prompt the USFWS to reconsider if the ARM is functioning as intended.”¹²⁶

In contrast to Dr. Walsh’s minority opinion, the document that FWS released on August 16, 2022, styled as an “evaluation” of the revised ARM Framework, did not offer any independent assessment of the revised ARM Framework. Rather, it repackaged the revised ARM Framework’s modeling with all of its flaws detailed above, at times appearing to copy and paste figures directly from the Subcommittee’s materials, and stated that the revision “poses negligible risk to red knot recovery and negligible risk of take under the Endangered Species Act.”¹²⁷ Nowhere did FWS question the validity of the revised ARM Framework or any of the underlying assumptions or decisions, including on any of the bases discussed in these comments and accompanying expert reports.

With its complete deference to ASMFC’s flawed modeling, assumptions, and conclusions, FWS unsurprisingly reached the same flawed result but did not bolster its validity. As these comments have shown, the revised ARM Framework incorporates numerous erroneous methodologies and assumptions. In its document, FWS propagated the same errors and replicated the same flaws as ASMFC. Moreover, since FWS relied on ASMFC’s non-public model, its assertions are effectively unverifiable. The revised ARM Framework is unreliable for the reasons demonstrated in these comments. The Framework also still needs a legitimate, thorough, independent review based on all underlying information—not just the information released publicly to date. FWS’s imprimatur does not resolve the defects of Addendum VIII.

VII. CONCLUSION

The window to save red knots is closing rapidly, especially for Southern wintering birds that fly the farthest and are most reliant upon horseshoe crab eggs at Delaware Bay. The revised ARM Framework would increase the pressure on this species, which is already vastly diminished on the beaches that once hosted its extraordinary migration. The Framework does not appreciate the importance of horseshoe crabs to red knots or the fragility of the horseshoe crab population itself. The weak relationship that it perceives between red knots and horseshoe crabs may well become a self-fulfilling prophecy, as the computer model continues to run while the ecosystem around it fades away.

The Horseshoe Crab Management Board has an obligation to restore red knots and horseshoe crabs at Delaware Bay. Just as importantly, it has a real—and maybe a final—opportunity to do so. For the reasons described above and in the attached expert reports, the Board should reject Addendum VIII.

¹²⁶ *Walsh Minority Opinion* 117.

¹²⁷ FWS, *Evaluation* at 3 of PDF. While the document is dated January 18, 2022, it was not released to the public until August 16. For an example of a copied figure, compare ASMFC, *Supplemental ARM Report* 30-31 figs. 10-11, with FWS, *Evaluation* at 5 of PDF fig. 1.

Review of 2021 ASMFC ARM revision

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September 2022

This is an expert review of the Adaptive Resource Management plan (ARM) proposed by ASMFC to guide management of the Horseshoe Crab fishery in Delaware Bay, performed by Kevin Shoemaker, Ph.D.

Dr. Shoemaker has a Ph.D. in Conservation Biology, a Master of Science degree in Conservation Biology, both from SUNY-ESF in Syracuse, NY, and a Bachelor of Science degree in Biology from Haverford College. He is a former Postdoctoral Fellow in the Department of Ecology and Evolution at Stony Brook University and a former Senior Scientist at Applied Biomathematics, an ecological research and development company located in Setauket, NY. Dr. Shoemaker is currently employed as an Associate Professor of Population Ecology at the University of Nevada, Reno. He has over 15 years of experience as a wildlife conservation scientist and has authored over 45 peer-reviewed scientific articles and book chapters on topics in wildlife ecology and conservation. He has expertise in Bayesian inference, machine learning, population ecology, and ecological modeling.

OVERVIEW

This report presents my review of the Adaptive Resource Management plan (ARM) proposed for use by the Atlantic States Marine Fisheries Commission (ASMFC) as a tool for guiding management of the horseshoe crab (HSC) fishery in Delaware Bay and protecting the Federally Threatened *Rufa* Red Knot (*Calidris canutus rufa*; REKN). Delaware Bay is a critical stopover site for REKN in their spring migration to breeding grounds in the high arctic from wintering grounds as far south as Tierra del Fuego (USFWS 2021). Specifically, HSC eggs deposited on coastal beaches provide a necessary high-calorie food resource for REKNs and other migrating shorebird

species as they replenish fat reserves depleted from their long migration and prepare for breeding. At the heart of the proposed ARM framework is an optimization model that provides harvest recommendations for female and male HSC, conditional on current estimates of HSC and REKN abundance. These recommendations are calibrated to maximize HSC harvest while causing minimal risk to the REKN population. The optimization model is based on a linked two-species simulation model (comprising a HSC and a REKN simulation model) that incorporates a one-way biotic interaction in which annual REKN survival and recruitment depend on female HSC abundance in Delaware Bay (among other covariates). While the stated objectives of the revised ARM are sensible, my review identified several concerns that suggest the revised ARM framework is not an appropriate tool for managing risk to HSC or REKN populations. Specifically, this report identifies six main areas of concern:

- (1) **The fitted relationship between HSC abundance and REKN vital rates (survival and fecundity) is of insufficient magnitude to forecast a decline in mean projected REKN population growth even under a total collapse of the HSC population.** The extremely weak REKN/HSC relationship used in the revised ARM is inconsistent with previous research documenting HSC eggs as a critical food resource for migrating REKN and with the documented decline of the REKN population over recent decades, which experts have linked to increases in HSC bait harvest during the 1990s (Niles et al. 2009; USFWS 2014). If the REKN population model is inconsistent with what has been observed in the recent past, it seems unlikely to yield robust forecasts of future risk to the REKN population (or recovery of this population) from which to base management decisions. The inclusion of a REKN population model within the ARM framework (both the initial and revised versions) presupposes that HSC harvest could put REKN populations at risk, at least under some scenarios. As it stands, the apparent inability of the revised ARM model to predict a decline of the REKN population even under a total collapse of the HSC population seems to violate this premise, and practically guarantees that the REKN population model will play an insignificant role in setting optimal HSC harvest rates.
- (2) **The HSC population simulation model fails to correctly propagate uncertainty about mean recruitment rates.** In specifying the bivariate normal distribution used to generate

annual male and female HSC recruitment rates (the most consequential empirically fitted parameters of the HSC simulation model), the proposed ARM framework treats uncertainty about annual recruitment rates as representative of temporal process variance (natural year-to-year fluctuations) rather than as a mixture of parameter uncertainty and process variance (Link and Nichols 1994; Regan et al. 2002; McGowan et al. 2011). This subtle but significant shortcoming will tend to manifest in simulation replicates that closely resemble one another, since key sources of uncertainty “regress to the mean” (good years cancel out bad years) instead of propagating over time. The importance of this distinction is magnified for long-lived iteroparous species like HSC, since these populations tend to be resilient to short-term fluctuations in reproduction or recruitment (Lovich et al. 2015). When this issue is corrected (using the same Bayesian approach used to treat process variation and uncertainty in the REKN simulation models in the revised ARM framework), preliminary simulation results suggest a highly uncertain outlook for the HSC population in Delaware Bay, especially when faced with harvest pressures. In sharp contrast to the ARM report and supplement, the population of HSCs in Delaware Bay appears to have a substantial (17.5%) probability of falling below the lowest previously estimated levels even in the absence of all direct anthropogenic sources of mortality (bait harvest, biomedical bleeding and discard mortality) over the next 50 years. Furthermore, a scenario in which HSCs are harvested annually at the current maximum allowable rates is accompanied by a severe risk of decline (33.45%) and disruption to the population age structure (lower multiparous/primiparous ratios than previously observed). Finally, an extreme harvest scenario in which two million male and female HSCs are harvested each year results in near-certain catastrophic population collapse over the 50-year time horizon, in contrast to the (original) ARM report, which suggests a relatively stable HSC population even under this extreme scenario (which greatly exceeds current maximum allowable rates).

- (3) **The Catch Multiple Survey Analysis (CMSA) exhibits poor fit to training and independent data, raising concerns about its use in projecting future HSC abundance.** Aside from being able to explain the apparent difference in mean HSC abundance before and after the “VT gap years” (see below; higher HSC abundance is both predicted and observed after the

period 2013-2016), the CMSA model explains very little, if any, of the observed variation in the primary data sources (three trawl surveys conducted in and around Delaware Bay). The CMSA results exhibit relatively good fit ($R^2 > 0.5$) to the recruitment data (primiparous abundance); however, this is unsurprising since there is only one source of data (VT swept area surveys) for estimating annual primiparous abundance versus three sources for estimating adult (multiparous) and total abundance. Given the overall lack of fit to training data, the HSC simulation model is unlikely to perform well for predicting independent validation data (data not used to fit the model). Indeed, when the CMSA results are challenged against the HSC spawning surveys – an independent estimate of HSC abundance for this region – there is no detectable relationship between these two independent estimates of HSC abundance. This lack of fit to both training and validation data raises concerns about the utility of the CMSA model, which informs all aspects of the proposed ARM, including the REKN IPM (where it represents the abundance of female HSC each year), the HSC projection model, and the annual harvest recommendation.

(4) **The “gap years” in the VT trawl survey data raise concerns about HSC recruitment estimates from the Catch Multiple Survey Analysis (CMSA).** As noted above, the CMSA is fundamental to all aspects of the proposed ARM framework. For the HSC population simulation models, the primary role of the CMSA is to parameterize HSC recruitment rates (which are the most consequential empirically derived inputs for the HSC simulation model). Unfortunately, of the three trawl surveys used to fit the CMSA models, the only survey that provides information for estimating recruitment – the Virginia Tech (VT) trawl surveys – was not conducted during a critical four-year period from 2013 to 2016 (hereafter referred to as the “VT gap”, during which no direct information was available for estimating annual HSC recruitment rates). The CMSA results suggest that the HSC population underwent a substantial state transition during the VT gap years in which the population was small but stable prior to the gap, and larger and more variable after the gap. More concerning, the CMSA predicts much higher average recruitment rates during the VT gap (for which no data are available for estimating recruitment) than at any single year before or after. The inflated average recruitment rates during the VT gap period are subsequently used for estimating

mean HSC recruitment rate for the HSC simulation models (thereby increasing estimated population resilience to harvest) – but unfortunately these high recruitment rates cannot be verified empirically. If average recruitment rates were computed from only those years in which recruitment could be verified empirically (i.e., excluding estimates from the VT gap years) the expected resilience of the HSC population to harvest would be substantially reduced.

(5) **The proposed ARM framework lacks ‘null model’ benchmarks and independent performance validation.** Null models are simplified representations of a system that lack many or all the proposed mechanisms that may help to explain the system dynamics; the typical null model in statistics assumes all observed variation is the result of a single random error process. By comparing complex models such as those used in the revised ARM with one or more null-model benchmark(s), researchers can determine whether the more complex models represent useful learned knowledge about a system (Koons et al. 2022). If a complex model fails to outperform a null model in terms of bias or precision (typically using independent validation data), the complex model is likely to be improperly specified or “overfitted” (whereby parameters are fitted to “noise” rather than true signal; Radosavljevic and Anderson 2014) and therefore not useful for prediction. The CMSA model fails to outperform even the simplest statistical null model (single intercept term with sampling error) for at least one data source (the VT swept-area estimate of female multiparous abundance). For the REKN component of the revised ARM, it would be informative to compare the performance of the REKN simulation model against a null model that omits any effect of female HSC abundance. It was recently demonstrated (Koons et al. 2022) that the ARM framework for guiding North American mallard harvest was unable to outperform a null model, and it would be instructive to pose a similar challenge to the REKN simulation model. If either model fails to outperform a null model, it should prompt managers to acknowledge that our current understanding of the effects of harvest on HSC populations remains insufficient for robust forecasting (Dietze 2017), and that a more precautionary approach may be warranted.

(6) **Lack of transparency.** The public still has no access to the data and code used for estimating

REKN population parameters, simulating REKN and HSC population dynamics, and running optimization routines (the CMSA code and data were made available). Without this data and code, it is difficult to fully assess the proposed ARM framework and to run scenario tests. If granted access to the code and data, there are a number of important null model tests (see above) and scenario tests that can be run, including (1) developing and testing the HSC and REKN models against a “null model” benchmark, (2) determining the ‘optimal’ female HSC harvest rates from the “canonical” versions of the HSC and REKN models in the absence of defined harvest limits, and (3) running the REKN simulation model under a scenario representing near-total collapse of the HSC population. The concerns identified above, which arise from analysis of the limited data and code made available to date, demonstrate, at a minimum, that such further testing is warranted. It seems prudent to delay implementation of the new ARM framework until the public and outside experts have had adequate time to scrutinize the statistical and simulation models that play such a central role in this proposed decision-making framework.

SUPPORTING EVIDENCE AND ANALYSES

The remainder of this report provides additional supporting details for the six major areas of concern identified above, including results and figures from re-analyses of the data presented in the ARM report.

1. The fitted relationship between HSC abundance and REKN vital rates (survival and fecundity) is of insufficient magnitude to forecast a decline in mean projected REKN population growth even under a total collapse of the HSC population

Including a model of REKN population dynamics as part of the previous and revised versions of the ARM framework implicitly acknowledges that reduction of the HSC population could, under some circumstances, have a negative impact on REKN populations. This assumption has a strong empirical basis, as multiple lines of evidence suggest that HSC eggs are an extremely important resource for migrating REKNs during their spring migration (e.g., Karpanty et al. 2006; Niles et al. 2009; USFWS 2014; USFWS 2021). Therefore, it is surprising that the fitted relationship between HSC abundance and REKN survival used in the revised ARM is very weak and appears to be

overwhelmed by random among-year variation (Fig. 47 from ARM Report; Fig. 9 from Supplemental Report; hereafter, I will use the notation 'ARM Fig. 47/9'). In fact, it appears from the ARM report that estimated REKN survival rates have generally decreased weakly over time despite an estimated increase in HSC abundance (ARM Fig. 44/7). Years with the lowest HSC abundance in the study period (at or near the lowest HSC abundances ever recorded in Delaware Bay) are coincident with the highest estimated REKN survival rates (ARM Fig. 47/9). Given this weak fitted relationship, simulated REKN abundance based on this model seems unlikely to be very sensitive to changes in HSC abundance. Indeed, a 'back of the envelope' calculation based on the REKN vital rates presented in the ARM report (and the slightly modified numbers presented in the Supplement) shows that the mean population growth rate (Λ) of the REKN population is likely to remain at or above replacement levels ($\Lambda \geq 1$) even at HSC population size equal to zero (Fig. 1). This calculation was produced by using the mean survival from Supplemental Table 8, mean recruitment estimated from Supplemental Fig. 7b, and the standardized logistic regression coefficients from Supplemental Table 9 (effect size = 0.37 for survival and -0.14 for recruitment) to model REKN survival and recruitment as a function of HSC abundance. As a brief aside, the regression coefficients presented in the ARM report (e.g., effect of HSC on survival) are standardized and are on the logit (log-odds) scale, making them difficult to interpret. A quick example may help to aid interpretation of the effect size of this relationship: given a coefficient of 0.37 (the mean regression coefficient for the relationship between HSC abundance and REKN survival from the ARM Supplement, Table 8), a loss of 1 million female horseshoe crabs from Delaware Bay would result in REKN survival rate declining by only 0.004 (from 0.93 to 0.926). This is consistent with visual inspection of ARM Fig. 47/9.

Although I did not have access to the code and data used to fit the relationships between HSC abundance and REKN survival and recruitment, the relationships I used to generate Fig. 1 closely match the relationships presented in ARM Fig. 46/8 (Fig. 2). Interestingly, the value for mean recruitment provided in Supplemental Table 8 ($\rho_{\text{mean}} = 0.063$) yields a declining REKN population ($\Lambda = 0.99$) even under average conditions from 2005 to 2017. Since this result is inconsistent with the reported Λ of 1.04 during that same period from ARM Table 25 (and the generally increasing population trajectories indicated in ARM Fig. 58/15), I chose to use the

mean annual recruitment estimated from Supplemental Fig. 7b, which I calculated to be 0.109 (or geometric mean of 0.099). Using these mean recruitment values resulted in a Lambda of 1.035 (for arithmetic mean) or 1.027 (for geometric mean), more closely resembling but still below the reported baseline Lambda of 1.04 from the ARM report; setting baseline Lambda to 1.04 would only make a stronger case that REKN populations would not be expected to decline under an HSC population collapse (Fig. 1). This simulation exercise makes it very clear that the REKN model used in the revised ARM would not be able to predict or explain the decline in the REKN population observed during the 1990s, which has been attributed to unregulated harvest of HSCs in Delaware Bay (Niles et al. 2009; USFWS 2014). If this framework is unable to explain the decline of the REKN population in the first place, it does not appear to be an appropriate tool for helping to reverse the decline and promoting the recovery of this threatened subspecies.

Note that the population vital rates used to generate Fig. 1 represent point estimates. Because there was uncertainty associated with the estimate of Lambda (CI from 1.00 to 1.06; ARM Table 25), and with the effect size of HSC abundance on survival rate (CI from 0.12 to 0.63; ARM supplemental Table 9), some simulation runs (i.e., those with small Lambda and larger effect size sampled randomly from the joint posterior distribution) are likely to indicate REKN population decline at low HSC abundances. It is likely that these (probably rare) simulations drive the shape of the REKN “harvest function” yielded by the approximate dynamic programming algorithm. However, without access to the IPM and simulation code, I am not able to formally test the behavior of the REKN simulation model under scenarios of HSC population decline or collapse.

Scenario: HSC population collapse

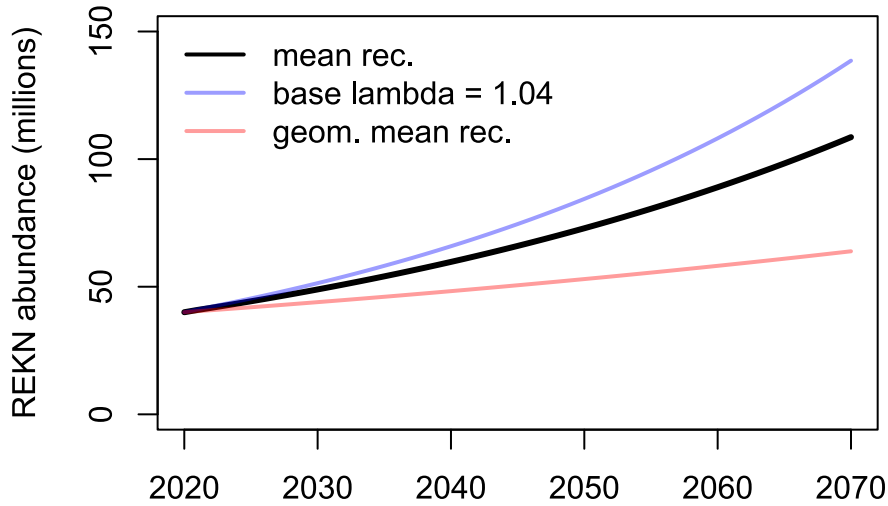


Figure 1. Results from a ‘back of the envelope’ calculation of REKN population growth under a scenario with depleted HSC population (female HSC abundance = 0 based on numbers presented in the ARM report. Mean recruitment rate was computed in three ways: arithmetic mean of values from ARM Supplemental Fig. 7b (“mean rec”), the geometric mean of these same values (“geom. mean rec.”), and a value fitted to ensure a population growth rate (Lambda) of 1.04, as indicated in the ARM report. Although somewhat simplistic, this figure illustrates that the reduction in REKN survival due to the collapse of HSCs in Delaware Bay appears to be insufficient to induce a meaningful REKN population decline. This figure is based on a simple age-structured population model and does not incorporate a density-dependence mechanism (the revised ARM includes a density ceiling that prevents the REKN population from growing above ~150k).

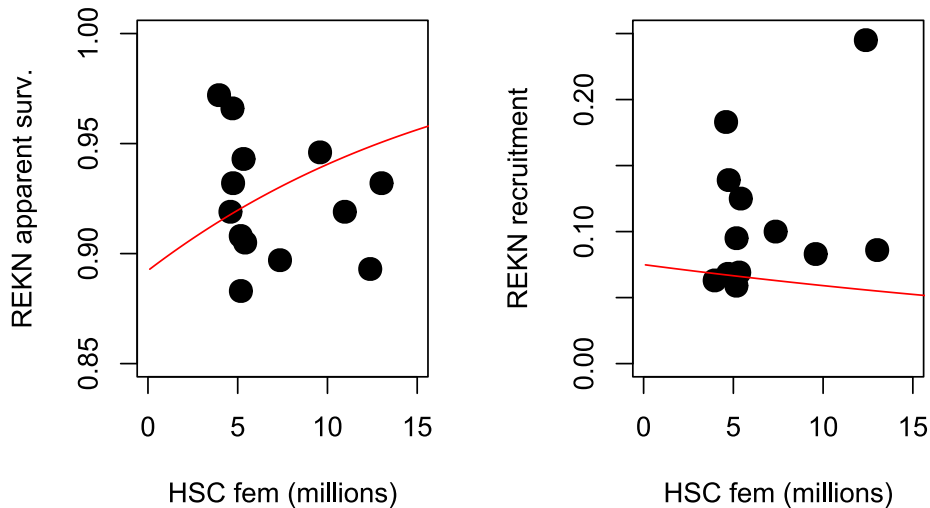


Figure 2. Relationships between female HSC abundance and REKN survival (left panel) and recruitment (right panel), recreated from information in the ARM supplemental report for the purpose of calculating the expected REKN population response to changes in the HSC population. Solid black dots represent annual vital rates estimated from ARM Supplement Fig. 9, and the red lines represent the fitted relationships presented in ARM Supplement Table 9.

Due to the weakness of the HSC/REKN relationship used in the revised ARM, and due to the complexity of the Integrated Population Model (IPM) framework used to represent the REKN population in the revised ARM, the relationship between HSC abundance and REKN population vital rates are likely to be unstable (sensitive to new data and alternative model specifications). Therefore, it is not implausible that the fitted relationship may disappear (become “non-significant”) – or even flip sign to become a negative relationship – when the IPM is fitted to additional observations. This outcome would pose an existential problem for the ARM framework, decoupling the two-species framework and rendering the REKN model unusable in the context of management. There does not appear to be a contingency plan for this outcome. More generally, the REKN IPM appears to have gone through several distinct versions before researchers settled on a final set of decisions to incorporate into the final model (there are several important differences between an earlier version of the IPM presented in Tucker [2019] and the ARM report). Ideally, the results from alternative representations of the REKN system should be considered in aggregate to better represent structural uncertainty about this system (Williams 2011).

The linked two-species modeling framework in the revised ARM assumes the relationship between REKN and HSC is independent of REKN densities (i.e., it assumes a prey-dependent functional response). Under this assumption, larger REKN populations do not require larger abundances of HSC females (i.e., more HSC eggs deposited) to support adequate per-capita weight gain; in other words, the ARM model assumes that a REKN population of 40k would experience the same per-capita survival and fecundity as a population of 400k for a given abundance of female HSC. Implicitly, this assumes a lack of interference among REKN individuals, and no decline in the mean quality or accessibility of HSC egg resources at elevated REKN abundances (Karpanty et al. 2011). Some researchers have argued convincingly that a ratio-dependent functional response – in which per-capita prey consumption depends on the ratio between prey and predator abundances – is likely to be more realistic for simulation models with discrete time steps that span the entire reproductive periods of predator and prey (Abrams and Ginzburg 2000), such as the linked two-species model used in the revised ARM.

The previous ARM framework used data gathered from multiple sources of data outside

Delaware Bay to parameterize the simulation models. The revised ARM attempts to use Delaware Bay data sources wherever possible – which is a significant advance in many ways, as the revised ARM is “fine-tuned” for the system and can be updated relatively easily as new data are collected. However, this modeling decision also limits the analyses to a small geographic area over a short period of time, potentially ignoring relevant evidence from other regions and/or time periods. Furthermore, the time frame over which data are available for fitting the population models used in the revised ARM represents a limited scope of historical variation during which populations of REKN and HSC were relatively small in comparison with earlier estimates. Using these models to forecast system dynamics under conditions outside the range of values used to fit the model (e.g., lower HSC abundances, higher REKN abundances) therefore requires extrapolation, which can be highly uncertain (and often inaccurate). Since both the HSC and REKN simulation models tend to produce forecasts that differ from current conditions (e.g., larger numbers of both species), and because the optimization routine relies on these simulated results, the management recommendations emerging from the revised ARM rely on highly uncertain extrapolations about HSC and REKN population dynamics and about how these two species may interact (analogous to extrapolations of species and community distributions under climate change; Araujo and Rahbek 2009). On one hand, the ARM framework is designed to be able to refine management policies as new data become available and as sources of uncertainty are reduced (Nichols et al. 2007). On the other hand, it does not seem prudent to implement management “experiments” that could potentially imperil a threatened or endangered species (TES), even under the rubric of adaptive management.

In summary, the relationship between HSC abundance and REKN survival appears to be too weak to induce a decline in REKN abundance (Fig. 1). If all HSCs in Delaware Bay disappeared today, the model would continue to predict a generally stable or increasing population of REKN over the next 50 years. Therefore, the revised ARM model would be unable to predict the decline of REKNs that was observed in recent decades, and which has been attributed in part to the decline in the HSC population (Niles et al. 2009; USFWS 2014). This lack of consistency between the revised ARM model and recent historical observations raises significant doubts about the ability of this model to accurately reflect future risks to the REKN population or to guide HSC

harvest decisions in a way that promotes REKN survival and recovery. Furthermore, the decision to include a REKN population model as part of the ARM framework (in both the original and revised versions) presupposes that HSC harvest could result in risk to the REKN population; the apparent inability of the ARM model to predict a decline in REKN abundance under a total HSC population collapse violates this premise and undermines the apparent purpose of the model.

2. The HSC population simulation model fails to propagate uncertainty about mean recruitment rates

The HSC recruitment process is the most consequential empirically fitted component of the HSC simulation model. Other elements of the HSC simulation model are not fitted to data – for example, natural mortality rate, the biomedical mortality rate, and bait harvest rates are fixed by the modelers. In the revised ARM, the recruitment process is fitted to data indirectly via the CMSA model; annual male and female recruitment estimates were used to fit a bivariate log-normal distribution (defined by a mean and standard deviation for each sex, along with a covariance between sexes – all on a logarithmic scale), which was then used to represent annual recruitment in the simulation model. The only other parameter fitted in the CMSA model – initial abundance – is not directly used in the simulation model. Recruitment is critical for any assessment of population resilience to harvest, since (in the absence of immigration, which is not included in the revised ARM), it is the only process that enables the population to overcome sources of mortality. Therefore, it is not surprising that the HSC simulation model is highly sensitive to changes in mean (log) fecundity (ARM Fig. 33; note that when I omit any reference to the supplemental report, I am referring to the primary ARM report). Given the high sensitivity of the HSC simulation model to the (log) mean HSC recruitment for males and females, it is critical that uncertainty about these parameters is properly represented in simulation models. However, the revised ARM framework incorrectly treats uncertainty about annual recruitment rates as representative of temporal process variance (natural year-to-year fluctuations) rather than as a mixture of parameter uncertainty and process variance (Link and Nichols 1994; Regan et al. 2002; McGowan et al. 2011). This is a subtle but consequential error, as sources of uncertainty will tend to “regress to the mean” (with good years cancelling bad years) instead of propagating over time.

To estimate the parameters for the log-normal recruitment process in the revised ARM, the following steps were taken: (1) log-normal distributions were separately fitted to each estimate of primiparous abundance (separately for each year and sex), based on estimates of parameter uncertainty (95% confidence intervals) derived from the CMSA results, (2) this collection of lognormal distributions (representing parameter uncertainty) was used to simulate annual male and female primiparous abundance for the years represented in the CMSA model (confusing parameter uncertainty with temporal process variation), and then (3) data from these simulations were used to fit a bivariate lognormal distribution (via maximum likelihood) for representing annual HSC recruitment in the ARM model. In general, parameter uncertainty should be represented in simulation models by drawing a single sample per replicate from a distribution of values representing parameter uncertainty (or by running replicates with “worst-case” and “best case” values for key parameters). However, the “canonical” version of the HSC projection model fails to address parameter uncertainty – most notably, uncertainty about the mean HSC recruitment rate, to which the HSC projection model is highly sensitive (ARM Fig. 33). Therefore, there is more uncertainty about the future of the HSC population in Delaware Bay than the revised ARM acknowledges. It is important to note that a sensitivity analysis was run in which expected recruitment was allowed to vary across simulation replicates within ca. 5% or 10% of the median recruitment value. This sensitivity test demonstrates an appropriate method for modeling parameter uncertainty; however, this test fails to represent the extent of uncertainty about the median HSC recruitment, which extends far beyond 10% of the mean estimated value (Fig. 3). Furthermore, this treatment of uncertainty was only run as a scenario test and was omitted from the ‘canonical’ version of the ARM that is proposed for use in managing the HSC harvest in Delaware Bay.

Interestingly, the REKN projection model in the revised ARM appears to represent parameter uncertainty appropriately. The key parameters of the REKN model were estimated using an Integrated Population Model (IPM), which were fitted in a Bayesian framework. In this framework, parameter uncertainty is represented by a joint posterior distribution that embodies the set of values that are consistent with the observed data. Furthermore, temporal process variation in the REKN population model is treated by explicitly modeling annual variability in key

vital rates (survival and recruitment) via annual random effects fitted with hyperparameters (Kery and Schaub 2011). This Bayesian hierarchical approach enables parameter uncertainty and process variation to be interpreted and modeled separately in a straightforward and intuitive manner. Specifically, parameter uncertainty is incorporated by running multiple replicates with different values drawn from the joint posterior distribution, and temporal process variation is included by sampling from the hyperparameters across years within each replicate (Goodman 2002).

To enable sensible propagation of parameter uncertainty in the HSC simulation model (analogous to the REKN model in the ARM), I constructed and fitted a hierarchical Bayesian version of the CMSA model. This model was fitted using the same data and model structure as the CMSA model included in the revised ARM. However, instead of estimating annual recruitment separately for each year and sex, the Bayesian CMSA model included an explicit representation of temporal process variance in recruitment (i.e., a “random effect” describing inter-annual variation in recruitment). This temporal process model was specified using a bivariate lognormal distribution exactly analogous to the HSC simulation model included in the ARM model, which included “hyperparameters” for male and female (log) mean recruitment, male and female (log) standard deviation, and a correlation term. By estimating temporal process variation directly, the Bayesian CMSA closely mirrors the HSC simulation model (analogous to the direct relationship between the IPM and the REKN simulation model), circumventing the multi-step process used in the ARM to generate the bivariate lognormal distribution from the CMSA results, and (most importantly) enabling the parameters of the bivariate lognormal distribution to be estimated directly from the data. To simulate HSC abundance over time, parameters for each replicate were drawn from the joint posterior distribution (representing parameter uncertainty), and temporal process variation within each replicate was simulated by sampling from the bivariate lognormal distribution. For the simulations, I incorporated the same restrictions in the stock-recruitment relationships indicated in the ARM report (driven by abundance and sex ratios for the years in which recruits were expected to have hatched).

Results from the Bayesian CMSA model indicate substantial uncertainty around mean HSC recruitment rates for both males and females (Fig. 3). Simulations (50 year time horizon) from

this model in the absence of any direct anthropogenic sources of mortality (no bait harvest, biomedical mortality or discard mortality) indicate that the future of the HSC population in Delaware Bay is uncertain; the population has a 17.4% chance of declining below 4 million females (combined multiparous and primiparous abundance) at least once in the next 50 years, equivalent to the lowest abundances estimated from 2003 – 2019 (period for which the CMSA model was fitted) (Fig. 4). This no-harvest scenario also had a 3.8% probability of falling below 3 million females over the 50-year simulation, well below any estimate from the VT swept area surveys. In contrast, the HSC projection model in the revised ARM indicates a large and sustainable HSC population under a scenario with no bait harvest but including other anthropogenic sources of mortality including biomedical harvest and discard mortality (ARM Fig. 30; note that this figure does not reflect changes in mean HSC recruitment following peer review—the Supplement does not update this figure but contains other figures indicating a sustainable HSC abundance even with a bait harvest; Supplemental Fig. 15). Simulations from the Bayesian CMSA also indicate a much higher probability of decline under a scenario in which males and females are harvested at their respective maximum allowable rates (but are not subject to biomedical and discard mortality); this scenario had a 33% probability of declining below 4 million females over the next 50 years, 11% probability of declining below 3 million females, and a 2% probability of declining below 2 million females (Fig. 4). This scenario also appeared to disrupt the age structure in many simulations, resulting in fewer multiparous adults than primiparous adults. In contrast, the HSC simulation model in the revised ARM suggests a stable or increasing HSC population even under maximum allowable harvest scenarios that also include biomedical and discard mortality (ARM Fig. 31; see above caveat). Finally, a scenario in which both female and male HSCs were harvested at a rate of 2 million per year (much higher than the current maximum rate) results in a high probability of decline or even extirpation over the 50-year simulation; there was a >99% probability of declining to below 3 million females, a 92% probability of declining below 1 million females, and a 12% chance of falling below 10k females (Fig. 4). In contrast, the HSC simulation model in the revised ARM predicted a relatively sustainable population of HSC even under this extreme scenario, with no risk of population collapse (ARM Fig. 32; note that the HSC simulation model in the supplemental report may not

sustain this level of harvest due to the reduced mean recruitment rate relative to the model used to generate ARM Fig. 32).

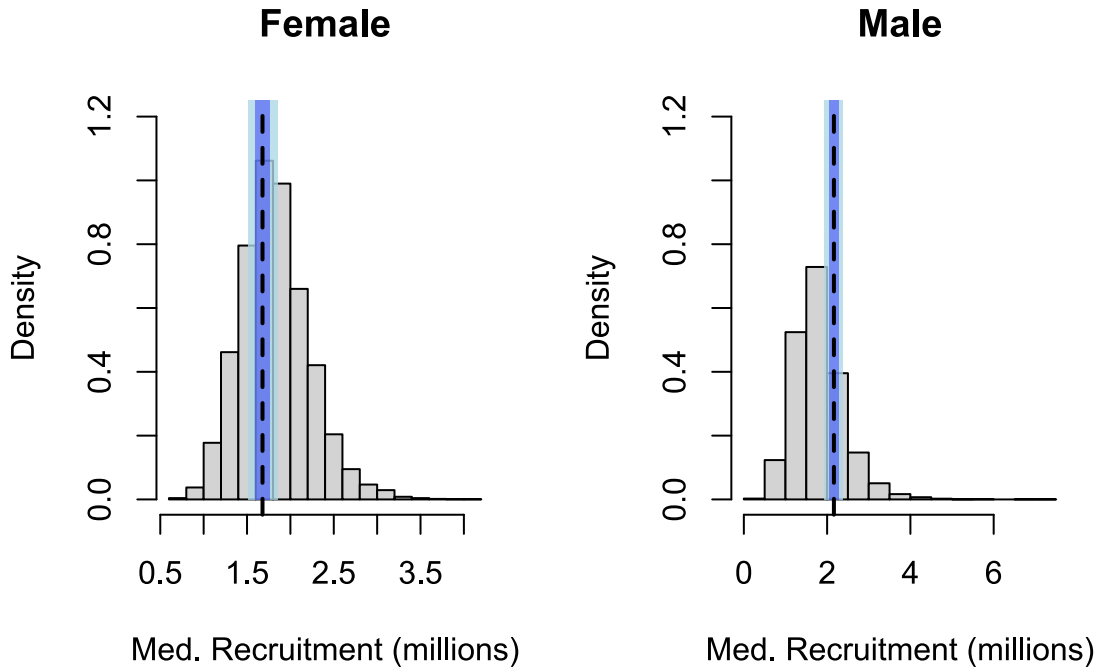


Figure 3. Posterior distributions representing parameter uncertainty for median female and male HSC recruitment rates, fitted using a Bayesian reanalysis of the CMSA model from the revised ARM (same data and model structure used to fit the CMSA model). Vertical dashed lines denote the median HSC recruitment values used in the base HSC projection model in the revised ARM. Light and darker blue shaded polygons represent the “added variation in expected recruitment” sensitivity tests from the ARM report (e.g., Fig. 69, 70). Note that the true range of parameter uncertainty falls well beyond the bounds of these sensitivity tests.

This critique is focused primarily on uncertainty about the annual HSC recruitment (primiparous abundance) parameters since they represent the ultimate source of projected resilience (or non-resilience) to harvest pressures and are therefore the most consequential fitted parameters in the CMSA simulation model. However, there are several other sources of uncertainty that should be accounted for in the HSC simulations. For example, natural mortality of HSC is set at exactly 0.3 (30%) across all sexes and age classes (primiparous and multiparous) in the revised ARM model, whereas there is substantial uncertainty about this parameter. The value of 0.3 was based on tag recovery data (assuming negligible harvest), but other lines of evidence seem to suggest natural mortality may be closer to 20% or even lower (as noted in the ARM

report). Lower estimates of mortality (higher survival and greater longevity) could imply lower resilience to harvest of adults (Midwood et al. 2015). Interestingly, natural mortality is an estimable parameter in the CMSA model; when modeled as a free parameter in the Bayesian CMSA, the model suggests that natural mortality is lower than 30%, but higher for females than males (note that Figs 3 and 4 are based on a model with natural mortality set at 30%, to match the ARM models). Other sources of uncertainty in the HSC population model include discard mortality (where 5% mortality was assumed for trawl and dredge surveys, while 12% mortality applied for gill nets) and biomedical mortality (assumed to be 15%). Although the ARM report documents a limited set of sensitivity analyses that were designed to test the degree to which key results changed under alternative parameter values (including mortality; ARM Table 18, 19), the relatively small set of sensitivity tests does not appear to comprehensively address these sources of uncertainty and seem inadequate for characterizing uncertainty about this system. Furthermore, uncertainty about these processes is not propagated through the HSC projection models.

In summary, if sources of error in the recruitment process are properly accounted for, the outlook for the HSC population in Delaware Bay is uncertain even in the absence of any harvest pressures. Based on a reanalysis of the existing data (using the same model specification used in the CMSA and HSC projection model), I found that harvest at the current maximum allowable rates has a high risk (11%) of causing the female HSC population to decline below the lowest levels ever recorded (3 million females). The HSC population models presented in the ARM report and supplement are not useful because they mis-characterize the risk of harvest pressures to the HSC population in Delaware Bay.

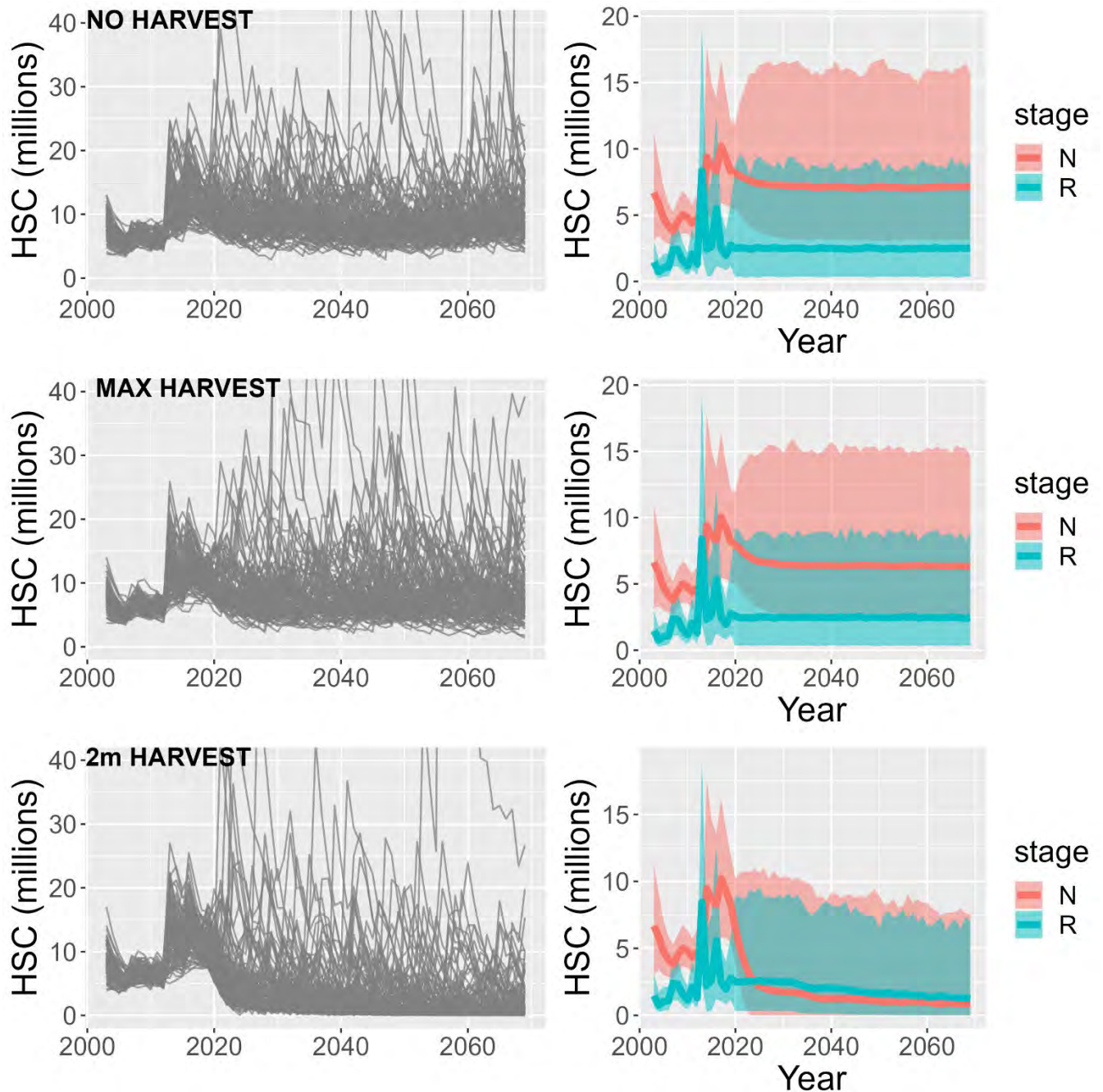


Figure 4. Female HSC population simulations run using fitted parameters (joint posterior distribution) from a Bayesian CMSA model, with uncertainty propagation performed in a manner analogous to the REKN projection model. The top row depicts simulations run under a no exploitation scenario (no bait harvest nor biomedical/discard mortality), the middle row depicts maximum allowable harvest rates (but also without biomedical and discard mortality), and the bottom row depicts an extreme harvest scenario (2 million females, 2 million males harvested annually). The left-hand panels depict trajectories of total abundance (primiparous and multiparous) for individual simulation replicates. Right-hand panels depict the 95% credible intervals for primiparous abundance (R) and multiparous abundance (N). None of these scenarios include biomedical or discard mortality.

3. The Catch Multiple Survey Analysis (CMSA) appears to exhibit poor fit to both training and independent data, raising concerns about its use in projecting future HSC abundance

The CMSA model explains little (and, in at least one case, none) of the variation in the data sources used to train this model (comprising three different trawl surveys conducted in and around Delaware Bay; here I present results for the female CMSA only) (Fig. 5). Notably, the CMSA performs worse than a statistical null model (all variation is assumed to be random “noise”) for predicting the multiparous female abundance estimated from the VT trawl surveys, with R^2 of -0.42 for the full time series (negative R-squared value indicates the CMSA model performs worse than the null model). In contrast, the CMSA results appear to exhibit relatively good fit ($R^2 > 0.5$) to the recruitment data (primiparous abundance) from the VT trawl surveys (Fig. 5; ARM Fig. 21). However, this is not a fair test; with only one source of data for estimating annual primiparous abundance (the VT trawl surveys) – and with a separate recruitment parameter fitted for each year – the CMSA recruitment results are practically guaranteed to resemble the observed recruitment data.

For the remainder of the datasets used to train the CMSA (DE and NJ trawls), it is instructive to note that the majority of the observed variance ‘explained’ can be attributed to the apparent difference in mean HSC abundance before and after the period 2013-2016 (during which the Virginia Tech trawl surveys were not conducted and therefore no estimates of recruitment were available; hereafter, “VT gap”, see below). Indeed, for the DE surveys the R-squared value drops to negative values for the periods before ($R^2 = -0.07$) and after ($R^2 = -0.03$) the VT gap period (versus $R^2 = 0.14$ for the full time series). Similarly, for the NJ trawl survey, the R-squared value drops to 0.11 for the period before the gap and falls below zero for the period after the VT gap ($R^2 = -0.05$; compared to $R^2 = 0.57$ for the full time series). More concerning, the CMSA can “explain” the apparent increase in the HSC population after the VT gap period only by estimating extremely high recruitment during the VT gap period (during which no recruitment information was available; see below for more details). Because no data were available for fitting recruitment (primiparous abundance) during the VT gap, the CMSA model was free to “fill in” whatever recruitment estimates produced the best match to available data (DE and NJ surveys were the only available data sources during this period)—even if these recruitment estimates

were unrealistically high or low (with no data available for comparison, there was no penalty for producing unrealistic estimates). If the CMSA is only able to fit the training data via unrealistic estimates of recruitment (see below), this strongly suggests a poorly specified model and raises serious doubts about using the CMSA results to represent and forecast the HSC population in Delaware Bay.

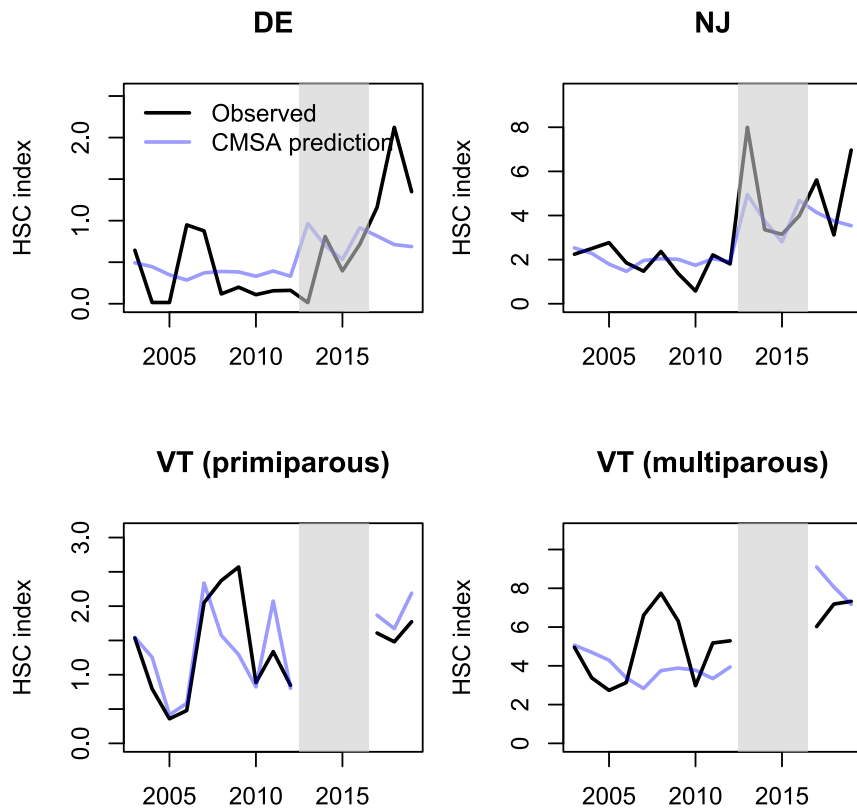


Figure 5. Illustration of the fit of the CMSA model to data on female HSC abundance derived from three trawl surveys: DE, NJ, and VT (the same sources of data that were used to fit the CMSA model). This figure presents the same information as ARM Fig. 21/4. The CMSA model performs well in predicting primiparous abundance (bottom left) but exhibits poorer performance for predicting adult (multiparous) abundance (bottom right) or total abundance (top row). The CMSA predicts little to no variation in adult/total abundance besides the difference in apparent mean abundance before and after the “VT gap years” (gray regions).

Given the lack of fit to training data, the HSC simulation model is unlikely to perform well when predicting to independent validation data (data not used to fit the model). Indeed, when the CMSA results are challenged against the Delaware Bay HSC Spawning Surveys (e.g., Zimmerman et al. 2020; <https://www.delawarebayhscsurvey.org/>), which provides an independent estimate of relative HSC abundance for this region, there is no detectable

relationship between these two independent estimates of HSC abundance (Fig. 6). This lack of fit to both training and validation data raises doubt about the utility of the CMSA results, which are central to all aspects of the proposed ARM, from fitting the HSC/REKN relationship to forecasting HSC abundance, to guiding annual decisions about HSC bait harvest.

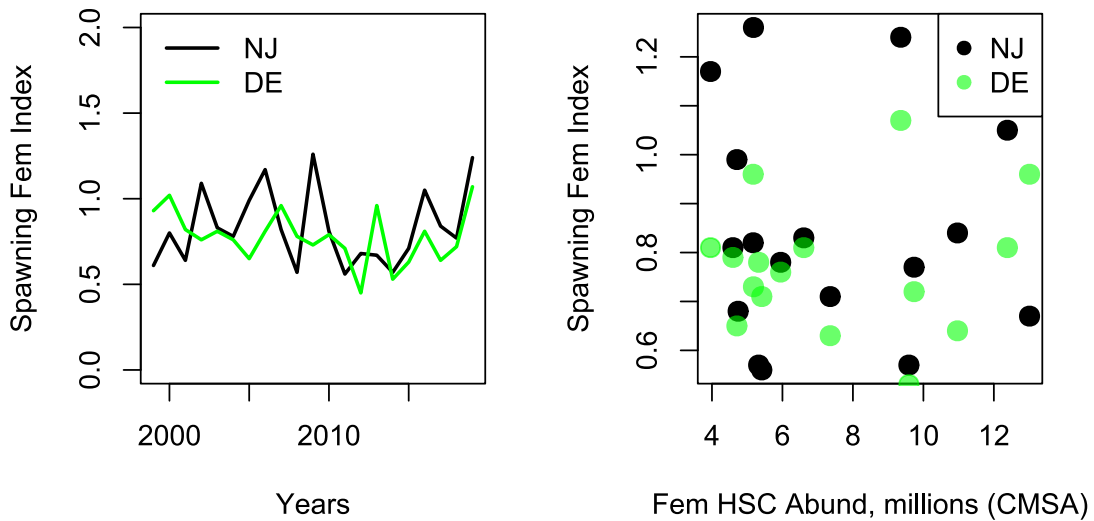


Figure 6. Comparisons of standardized HSC spawning female counts from DE and NJ beaches (an index of relative female HSC abundance analogous to trawl surveys) with (left) each other and (right) with the CMSA estimates of female HSC abundance in Delaware Bay (in millions). The two spawning surveys exhibit very little correlation between the NJ and DE sides of Delaware Bay from 1999 to 2018 (left panel; correlation = 0.25). In addition, there is no detectable relationship between spawning counts (on either the NJ or DE sides) and CMSA estimates of female HSC abundance (right panel).

In summary, the CMSA model does not perform well when predicting to the training data (the three sources of data used to fit the model). Although the model can explain some of the apparent difference in mean HSC abundance before and after the ‘VT gap years’, this ‘ability’ is driven by inflated recruitment rate estimates during the VT gap years that cannot be verified empirically (see below). Furthermore, the CMSA model explains virtually none of the observed variation in HSC spawning abundance from the same period, which represents an independent index of HSC population size. The poor performance of the CMSA model in predicting observed variations in HSC abundance in Delaware Bay calls into question the utility of this model – which is central to all aspects of the ARM model – as a robust system for characterizing and predicting

the HSC population in Delaware Bay.

4. The “gap years” in the VT trawl survey data raise concerns about HSC recruitment estimates from the Catch Multiple Survey Analysis (CMSA)

As noted previously, the CMSA is fundamental to the proposed ARM framework. For the HSC population simulation models, the primary role of the CMSA is to parameterize HSC recruitment rates (which are the most consequential empirically derived inputs for the HSC simulation model). Unfortunately, of the three trawl surveys used to fit the CMSA models, the only survey that provides information for estimating recruitment – the Virginia Tech (VT) trawl surveys – was not conducted during a critical four-year period from 2013 to 2016 (referred to in this report as the “VT gap”, during which no direct information was available for estimating annual HSC recruitment; note that the missing survey years were actually 2012-2015, but the VT results were lagged forward within the CMSA to ensure comparability with the DE and VT trawls). The lack of information on primiparous abundance during the VT gap years leads to several nonsensical results in the CMSA model. For example, in one year (2013; the first VT gap year) the estimated number of new female recruits is near 10 million – approximately 8 times larger than the average estimated recruitment rate from the 10-year period from 2003 to 2012 and 4 times larger than the maximum estimate during this 10-year time frame (ARM Supplemental Table 3). The following year (2014), the point estimate for primiparous abundance goes down to 2, i.e., 2 primiparous female individuals across Delaware Bay. Furthermore, the standard error estimates for primiparous abundance during the VT gap years are very large – in fact, the upper bound on the confidence intervals approaches infinity for one year (2014).

The CMSA results suggest that the HSC population underwent a substantial state transition during the VT gap years in which the population was small but stable prior to the gap, and larger and more variable after the gap. In the fitted CMSA model, this state transition appears to be driven by extremely high recruitment rates during the VT gap years. Concerningly, the CMSA model (including the Bayesian version of the CMSA model described above) predicts much higher mean annual recruitment rates during the VT gap (for which no data are available for estimating recruitment) than at any single year before or after (Fig. 7). Specifically, mean

annual recruitment during the VT gap years was estimated at 4.2 million (using the arithmetic mean, per the ARM report), versus 1.2 million before the gap and 1.9 million after the gap (using the geometric mean to represent the median of a lognormally distributed sample, per the ARM report). The inflated mean recruitment rates during the VT gap period are subsequently used for estimating the average HSC recruitment rate for the HSC simulation models (thereby increasing estimated population resilience to harvest) – but unfortunately these high recruitment rates cannot be verified empirically.

In summary, the CMSA model estimates abnormally high annual recruitment rates during the VT gap years (Fig. 7). These very high estimates are unverifiable, as no data on HSC recruitment was collected during these years. In the original ARM report, the average annual recruitment used in the HSC simulation model relied heavily on the inflated estimates of recruitment during the VT gap years, discounting the pre-gap years entirely. After peer-review, the ARM was altered to consider all years instead of discarding lower estimates from the pre-gap years. Nonetheless, the revised ARM model continues to treat the mean recruitment rate during the VT gap as reliable, allowing these inflated estimates to contribute to the estimate of average annual HSC recruitment used for the HSC simulation models (which are highly sensitive to the estimate of average recruitment; ARM Fig. 33). If the extremely high recruitment estimates during the VT gap years were to be excluded from this estimation process out of precaution, the average annual HSC recruitment rate would drop substantially (Fig. 7), further reducing the expected resilience of this population to harvest pressures. Ultimately, the inflated estimates of recruitment during the VT gap years are likely to be an artifact of the CMSA model specification (and the lack of data on recruitment for those years) and are unlikely to be reflective of true HSC recruitment rates. However, there remains no way to verify HSC recruitment rates during this period. Given this uncertainty, a conservative (precautionary) approach would be to exclude the VT gap years when computing recruitment for the HSC population simulations (Fig. 7).

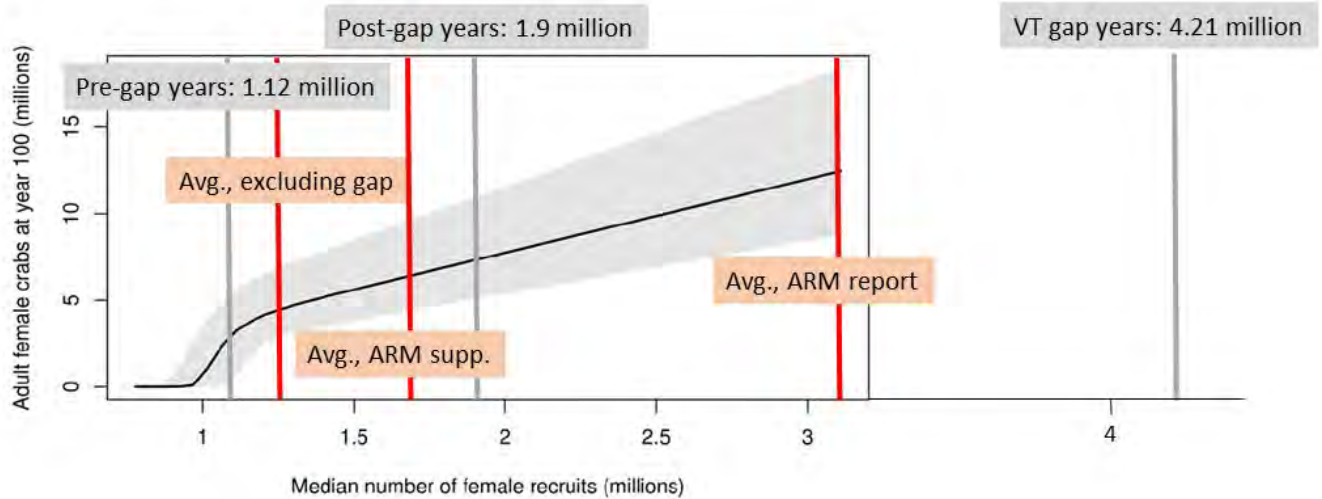


Figure 7. Annotated version of ARM Fig. 33, which (in its original form) illustrates the sensitivity of HSC simulation results to changes in average HSC recruitment rates. Annotations reflect the average female recruitment before, after and during the VT gap years (in gray), the average recruitment value used in the original 2021 ARM report (red, far right), the value used in the supplemental report produced after peer-review (red, middle) and the analogous estimate computed by excluding the VT gap years (red, left). Average recruitment estimated for the VT gap years (arithmetic mean of 4.21 million based on the latest CMSA results) falls well outside the range of estimates during years for which recruitment was an observable process (and well outside the range of the x-axis of the original figure). The ARM report ignored recruitment estimates from the pre-gap years, giving very high weight to the inflated estimates during the VT gap years. Based on the peer-review, which suggested that the pre-gap years should not be excluded from the estimation of average recruitment rates, the current proposed value (described in the ARM supplement) is much lower than the value used in the ARM report (1.67 million vs. 3.1 million). However, the new proposed value continues to include unverifiable estimates from the VT gap years. If the VT estimates were excluded out of precaution, the average annual HSC recruitment would drop to 1.26 million, perilously close to the sustainability threshold identified in this figure (i.e., ARM Fig. 33).

5. The proposed ARM framework lacks ‘null model’ benchmarks and independent performance validation

Null models are simplified representations of a system that lack many or all the explanatory mechanisms hypothesized to operate in the system. In statistics (e.g., linear regression analysis) the typical null model assumes all system variation is a result of unexplained variance in the form of random noise (often a single random error process). In other contexts, null models may include additional processes/mechanisms but omit a key focal mechanism, enabling researchers to test whether that focal mechanism contributes usefully to predictive performance. In the context of adaptive harvest management, a null model would at least omit

consideration of the impacts of harvest processes on system dynamics, which ultimately informs management decisions (Koons et al. 2022). By comparing complex models such as those used in the revised ARM with one or more null-model benchmark(s), researchers can determine whether the more complex models represent useful learned knowledge about a system (Koons et al. 2022). If a complex model fails to outperform a null model in terms of bias or precision (typically using independent validation data), the complex model is likely to be improperly specified or “overfitted” (whereby parameters are fitted to “noise” rather than true signal; Radosavljevic and Anderson 2014) and therefore not useful for prediction.

In the context of the HSC fishery in Delaware Bay, it would be informative to compare the performance of the HSC simulation model against a null model that omits all information about HSC harvest from the model fitting process; this would enable assessment of our current understanding of how estimated rates of harvest affect the HSC population. Given the poor fit of the HSC simulation model to training and validation data (see above), the HSC simulation is unlikely to outperform simpler null models. In fact, the CMSA model fails to outperform the simplest standard null model (single intercept term with sampling error) for at least one data source (the VT swept-area estimate of female multiparous abundance) despite its complexity (~20 parameters for the CMSA vs 1 parameter for describing expected abundance each year). If the HSC simulation model fails to outperform a model in which population dynamics are driven by noise instead of harvest, it should prompt managers to acknowledge that our current understanding of the effects of harvest on HSC populations remains insufficient for robust forecasting (Dietze 2017).

For the REKN component of the revised ARM, it would be informative to compare the performance of the REKN simulation model against a null model that omits any effect of female HSC abundance. It was recently demonstrated (Koons et al. 2022) that the ARM framework for guiding North American mallard harvest was unable to outperform a null model, and it would be instructive to pose a similar challenge to the REKN simulation model. Given that all the deterministic processes (fixed effects) included in the IPM model were very weak (i.e., the HSC effect on survival and fecundity; see above) or “non-significant”, it is already apparent that random noise overwhelms most signal in the training data regarding how the HSC population

affects REKN population dynamics. Therefore, it is likely that information about the HSC/REKN relationship would explain little if any of the variation in independent validation data. Furthermore, the lack of a relationship between the HSC model (CMSA) and the number of spawning females observed on coastal beaches (see above) makes it even more unlikely that the current REKN population model would outperform a null model that excludes any effect of HSC abundance (since the HSC/REKN relationship is based on the consumption by REKNs of HSC eggs deposited by spawning females).

In summary, null model benchmarks should be incorporated into the ARM framework to ensure that effective learning is occurring and that managers acknowledge uncertainty about how their decisions affect the populations they are charged with managing (Koons et al. 2022). If one or both simulation models that form the core of the revised ARM framework fail to outperform null models, it would strongly suggest that the ARM framework's current level of understanding about how management decisions are likely to affect the HSC and REKN populations is insufficient for robust forecasting of population-level risk to either species from HSC harvest. Although the ARM process is designed to treat management actions as opportunities for learning – updating harvest recommendations as new data become available (Nichols et al. 2007) – the fact that one of these species is federally threatened (USFWS 2014) justifies a more precautionary approach for risk management.

6. Lack of transparency

The public still has no access to the data and code used for (1) estimating REKN population parameters via a Bayesian integrated population model (IPM), (2) simulating REKN and HSC population dynamics, and (3) running the optimization routines via approximate dynamic programming (ADP). The CMSA code and data were made available, which enabled me to re-analyze the HSC survey data and run informative scenario tests (see above). Without the data and code for other components of the ARM model, it is not possible to re-analyze the data, test key assumptions, or simulate population dynamics under different hypothetical scenarios. Given the substantial concerns generated by the data and code that has been made publicly available to date (discussed above), such further re-analysis, testing, and simulation is warranted. If granted access to the code and data, there are several important questions that could be

addressed more thoroughly, including but not limited to:

- 1) How would HSC abundance projections change – and how would harvest functions change – under the lower mean recruitment estimate produced by excluding anomalous estimates from the VT gap years?
- 2) What would happen to the REKN population projections if female HSC abundance were set to zero?
- 3) Does the REKN projection model outperform a null model that excludes any effect of HSC abundance?
- 4) In the REKN IPM, does the effect of HSC abundance disappear (or flip sign to become a negative relationship) under alternative plausible model specifications?
- 5) What proportion of variation in apparent survival in the REKN IPM model is explained by the HSC effect vs. random among-year variation?
- 6) Does an index of HSC spawning or HSC egg densities explain more variation in REKN survival and fecundity than the CMSA-derived estimate of HSC abundance?

CONCLUSION

In this report I have outlined six major concerns about the revised ARM. First, the modeled relationship between REKN vital rates and HSC abundance does not appear to be strong enough to induce an expected decline in the REKN population even under a catastrophic collapse of the HSC population. The apparent inability of the model to predict a major population response of REKNs to the depletion of the Delaware Bay HSC stock invalidates the premise of including a REKN population model within the ARM framework, which implicitly assumes that (1) HSC eggs are a critical resource for REKN populations and (2) HSC harvest could inhibit or slow the recovery of the REKN population, at least under some circumstances. The apparent inability of the ARM model to show a strong population-level effect of HSC harvest on REKN populations is inconsistent with the observed decline of the REKN population in recent decades, which many researchers have attributed to increased HSC harvest rates in the 1990s. Therefore, the REKN model included as part of the revised ARM does not appear to be a useful tool for assessing and managing risks to the REKN population from HSC harvest – or for promoting recovery of the REKN population.

In addition, I have identified several concerns about the HSC data analysis and simulation models. First, the HSC model in the revised ARM does not appropriately address key sources of uncertainty – particularly with respect to HSC fecundity (the source of potential harvest resilience). When these sources of uncertainty are addressed, the outlook for the HSC population is more uncertain than indicated in the ARM report. My analyses indicate that harvest at the maximum allowable levels could put the population in jeopardy (~11% risk) of decline below 3 million females – well below the minimum level previously recorded – within the next 50 years. In addition, the Catch Multiple Survey Analysis (CMSA), which is central to all aspects of the ARM, appears to exhibit poor fit to both training and independent data. I was unable to detect any correlation between the CMSA estimate of female HSC abundance and the estimated number of spawning females on coastal beaches in Delaware Bay. Finally, the estimate of HSC recruitment (which determines harvest resilience in the projection models) used in the revised ARM incorporates questionable (and highly inflated) estimates from a four-year period during which direct information on HSC recruitment was not available. Taken together, the above concerns strongly suggest the ARM model is not a valid tool for managing risk to the HSC population in Delaware Bay.

My final concerns are more general. First, I suggest that both the REKN and HSC models should be subjected to more rigorous evaluation, including tests for whether these models are able to outperform “null model” benchmarks that assume no useful learned knowledge about population dynamics and population response to harvest and harvest management. Ecological null models provide a useful benchmark for gauging the degree to which knowledge is accrued through the adaptive management process, and a mechanism for keeping modelers and managers “honest” by acknowledging an incomplete or inadequate understanding of the systems they are charged with managing. My analysis demonstrates that the CMSA model fails to outperform the simplest statistical null model for at least one data source. Finally, I was not provided access with much of the data and code used to generate the models used in the revised ARM (except for the CMSA code and data). Given the concerns that are apparent based on analysis of the limited code and data made available to date, it seems prudent to, at a minimum, delay implementation of this framework until the public and outside experts have had adequate

time to scrutinize the statistical and simulation models that play such a central role in this proposed decision-making framework.

Despite the lack of transparency, I was able to run several informative re-analyses and scenario tests with the information provided in the ARM report and supplement, and with the CMSA code and data. Based on my analysis, there is sufficient evidence to conclude that the ARM framework is not useful for assessing the resilience of the HSC population to harvest pressures, nor for managing risk to the REKN population due to HSC harvest.

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EXPERT REPORT

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29 September 2022

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1 Scope of Work

I was asked by representatives of EARTHJUSTICE to evaluate the Atlantic States Marine Fisheries Commission’s Report and Supplemental Report to the 2021 Revision to the Adaptive Resource Management (ARM) Framework dealing with horseshoe crab (*Limulus polyphemus*) fishery management and implications for red knot (*Calidris canutus*) conservation. The red knot (RK hereafter) has been listed as “threatened” under the Endangered Species Act, and relies on horseshoe crab eggs buried along beaches of Delaware Bay to feed as it migrates along North and South America. The conclusions in the ARM report relate to an amendment proposed through the Atlantic States Marine Fisheries Commission (ASMFC) that would likely allow female horseshoe crab (HSC hereafter) harvest in Delaware Bay for the first time since 2012 and thereby potentially reduce food provisions (HSC eggs) needed by migrating RK. My primary goal is to evaluate the evidence in favor of the amendment objectively and determine if the amendment is justified.

In forming my opinions, I reviewed and considered various data sources regarding the HSC fishery and RK conservation along the Mid-Atlantic coast, with emphasis on Delaware Bay. My opinions are also based on my extensive experience conducting research and providing technical advice on fishery management and conservation of various marine species (see Section 8). My compensation is not contingent upon the conclusions or outcome of my review.

2 Summary Opinion

Based on my analysis and my expertise in conservation, fisheries and fishery management, I conclude to a reasonable degree of scientific certainty that:

The proposed amendment that would allow harvest of female horseshoe crabs is not justified by the available scientific evidence, due to various *risk-prone* decisions and assumptions that underlie the Adaptive Resource Management framework and model. The proposed amendment thereby poses a significant risk both to the Horseshoe Crab population and Red Knot recovery.

3 Abbreviations and Definitions

ARM: Adaptive Resource Management framework

HSC: Horseshoe Crab (*Limulus polyphemus*)

RK: Red Knot (*Calidris canutus*)

VTS: Virginia Tech HSC survey

DES: Delaware HSC survey

NJS: New Jersey HSC survey

Risk-prone: Conservation or management actions based on overly optimistic assumptions about the status of a population. The assumptions may be about data sources, observations or data, and often involve ignoring information to the contrary of optimistic conclusions about population status. For endangered or threatened species, a risk-averse, rather than risk-prone, strategy based on the precautionary principle is critical for population recovery, population conservation, and sustainable resource management.

4 Opinions

The following specific opinions describe various lines of evidence indicating that the HSC population is not in a healthy state and has not fully recovered despite a prohibition on female harvest since 2012. The different lines of evidence are effectively “red flags” leading to the conclusion that the current and proposed management strategies are risk-prone, such that harvest restrictions should not be relaxed at present. To the contrary, further management actions or improvements to the current management plan are necessary to stimulate HSC recovery. Furthermore, due to the lack of *substantial* improvement of the HSC spawning stock (i.e. mature females), the existing HSC management strategy has not significantly enhanced food availability for the threatened RK and therefore its recovery. A shift to risk-averse management based on the precautionary principle is essential for HSC and RK recovery.

4.1 Low Newly Mature Female, Recruit and Spawning HSC Abundance

An expectation from the female harvest prohibition is a rebound in young mature females and recruitment of immature males and females into the HSC population. In 2019 and 2020, abundance of newly mature females was at an all-time low; recruitment of immature females and males was extremely low and unchanged since before the prohibition; and female abundance in the spawning survey dropped sharply in 2019. These are warning signs that the HSC population has not fully recovered and may even be declining. Thus, female harvest should not be raised.

4.2 Smaller Body Size of Mature Female HSC

An expectation of the female harvest prohibition is that female body size would increase, given constant recruitment, which is a typical response in fisheries worldwide when harvest pressure on older, larger females is reduced. On the contrary, mean size of mature female HSC was smallest in the last 3 years (2018 to 2020) and of newly mature females in the last 2 years of the time series from 2002 to 2020, despite the prohibition on female harvest since 2012. These data are inconsistent with the previous expectation and the premise that the female segment of the HSC population has rebounded.

4.3 Loss of Large Mature Female HSC and Lower Egg Production

Population egg production is a function of spawning stock (= mature females) biomass (i.e. weight). Hence, changes in size distribution of mature females will affect total egg production, particularly the loss of large HSC females which contribute disproportionately to total egg production. Consequently, using only HSC abundance to estimate reproductive output and egg production is ignoring main biological drivers of population egg production—size structure and biomass—of the HSC spawning stock. Size distribution of mature females has shifted to smaller females. Abundance of females larger than 300 mm prosomal width (i.e. females with the highest egg production) has dropped recently, particularly from 2018 to 2020. Recent low recruitment means that smaller mature females are not compensating for the loss of larger mature females. Consequently, total reproductive (egg) output has likely not improved, which hampers recovery of the HSC and RK populations.

4.4 HSC Sex Ratio

When HSC harvest has been restricted to males, the ratio of males to females should have decreased. In contrast, male:female sex ratios have actually increased from 1999 to 2019. This represents another warning sign that the current management strategy has not been effective, that population dynamics are not well understood, and that harvest of females should not be increased.

4.5 High Mature Female HSC Mortality

The combination of discard mortality and bait harvest mortality for females has increased substantially in recent years and is comparable to levels before the prohibition. Assuming that the prohibition has worked is therefore risk-prone. The collective bait harvest and discard mortality is not being controlled effectively and inhibits HSC recovery.

4.6 Reliance on HSC Density as the Indicator of HSC Population Status

Female density (catch per unit area) is a primary variable used in HSC surveys and the ARM framework model. Reliance solely on HSC density or abundance ignores other variables that commonly produce warning signs about the status of a stock, such as female size, female size-frequency distribution, spawning stock biomass and female:male sex ratio. These variables are often more sensitive indicators of problems in a population, meaning that they can detect problems more effectively than abundance estimates. Hence, the current management strategy is risk-prone by ignoring these more sensitive indicators.

4.7 Low HSC Egg Density

Recent data indicate that HSC egg densities in HSC spawning habitats and RK feeding grounds remain an order of magnitude below densities when RK and HSC were relatively abundant. The ARM process has decided to ignore patterns in HSC egg density because of methodological “uncertainty” in the data. Under conditions where a population is not in danger, this may be acceptable, but absolutely not when it represents a potential warning sign about a population in danger, such as the RK. Thus, lack of use of HSC egg density data, as a proxy for RK food availability, amounts to a failure to incorporate all available scientific information into the analysis to guide management decisions in a risk-averse manner.

4.8 Lack of Correlation of HSC Surveys

Data from the DES and NJS of HSC in Delaware Bay are assumed to be correlated with the VTS and used to fill in survey gaps in the VTS. Survey data when all three surveys were conducted are not correlated, and data from the DES and NJS were relatively higher than that from VTS. These results lead to an overestimation of HSC abundance during VTS gap years, which is indicative of a risk-prone assumption.

4.9 Degraded HSC Spawning Habitat and RK Feeding Grounds

Spawning habitat (e.g. beaches) for HSC and feeding grounds for RK have been lost throughout the stopover range of RK in the Mid-Atlantic. Loss of habitat is an additional stress that demands risk-averse management of mortality sources (e.g. fishing) which management can control. There may be variables that are beyond ASMFC’s control, but that means they should be more precautionary

with variables they can control, and it's certainly not a valid basis for ignoring warning signs like reduced HSC egg density and abundance.

5 Evidence for Opinions

The VTS is based on robust experimental design principles, and is the only spatially widespread survey that includes the coastal zone along Delaware and New Jersey, as well as Delaware Bay. In addition, the VTS collects much more comprehensive demographic data, which enables more types of analysis. Thus, the VTS serves as a robust and independent measure of HSC population status. The remainder of the analysis therefore focuses on data from the VTS and other published information on horseshoe crabs and the red knot. All analyses were conducted using the statistical software package R, version 4.1.2 (2021).

5.1 Low Newly Mature Female, Recruit and Spawning HSC Abundance

An expectation from the female harvest prohibition is a rebound in young mature females and recruitment of immature males and females into the HSC population. In 2019 and 2020, abundance of newly mature females was at an all-time low; recruitment of immature females and males was extremely low and unchanged since before the prohibition; and female abundance in the spawning survey dropped sharply in 2019. These are warning signs that the HSC population has not fully recovered and that female harvest should not be raised.

Data from the VTS on abundance of newly mature female HSC in 2019 and 2020 were at the lowest levels in the time series since 2002, indicating low influx of young mature females into the spawning stock (Figure 1). Similarly, abundance of immature female and male HSC, representing future recruitment to the adult segment and spawning stock of the population, were at extremely low levels and unchanged from those before 2013 (Figure 1). Moreover, female abundance in the Delaware Bay Horseshoe Crab Spawning Survey dropped sharply in 2019 (Figure 2), despite the prohibition of female harvest since 2012.

5.2 Smaller Body Size of Mature Female HSC

An expectation of the female harvest prohibition is that female body size would increase, given constant recruitment, which is a typical response in fisheries worldwide when harvest pressure on older, larger females is reduced (Beverton and Holt, 1956; Gedamke and Hoenig, 2006). On the contrary, mean size of mature female HSC was smallest in the last 3 years (2018 to 2020) and of newly mature females in the last 2 years of the time series from 2002 to 2020, despite the prohibition on female harvest since 2012. These data are inconsistent with the previous expectation and the premise that the female segment of the HSC population has rebounded.

VTS data were examined in two ways (mean and mode of size-frequency histograms) to evaluate this expectation. First, the time series of mean size in the VTS (Figure 3) indicated that mean sizes of mature female HSC and of newly mature females from 2016 to 2020 were the smallest in the time series from 2002 to 2020, despite the prohibition of female harvest since 2012.

Given that the mean of a sample can be influenced by outliers, the size data were also examined using a non-parametric statistic, the mode. The median could not be calculated because the raw data were unavailable for this analysis. The mode for each year was visually estimated from the size-frequency histograms of mature females (Appendix Figures 10 and 11). As with the mean, modal sizes of mature females from 2018 to 2020 were the lowest in the time series (Figure 4). In contrast, modal sizes of mature males were relatively unchanged (Figure 4).

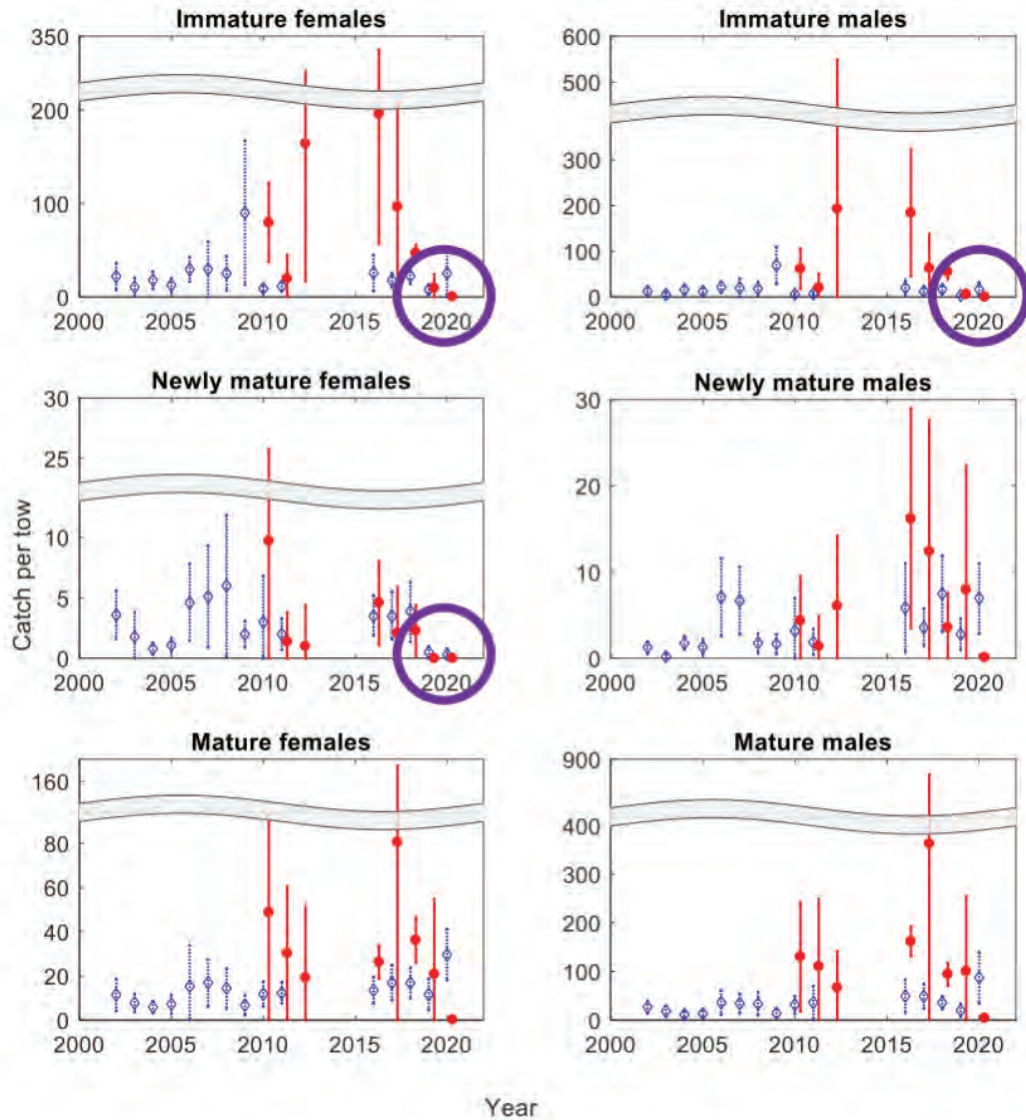


Figure 1: Densities of HSC males and females from Figure 3 of the VTS report (Hallerman and Jiao, 2021). Purple circles have been added to highlight the warning signs that the HSC population has not fully recovered.

Mean body size of spawning females could decrease over time if there was high recruitment of smaller, newly mature females shifting down the average size. However, the opposite (weak recruitment) appears to be the case, as described in section 5.1.

5.3 Loss of Large Mature Female HSC and Lower Egg Production

Population egg production is a function of spawning stock (= mature females) biomass (i.e. weight). Hence, changes in size distribution of mature females will affect total egg production, particularly large HSC females which contribute disproportionately to total egg production. Consequently, using only HSC abundance to estimate reproductive output and egg production is ignoring the main biological drivers of population egg production—size structure and biomass—of the HSC spawning stock. Size distribution of mature females has shifted to smaller females. Abundance of females larger than 300 mm prosomal width (i.e. females with the highest egg production) has dropped recently,

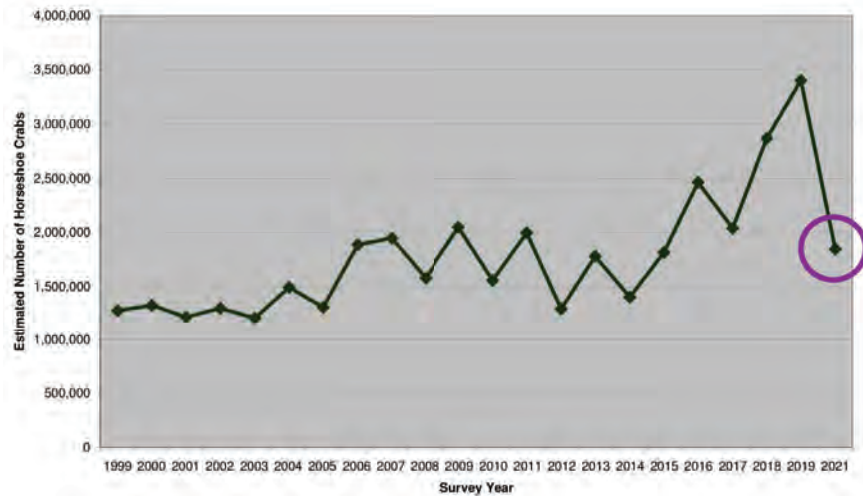


Figure 2: Spawning horseshoe crab survey data, highlighting low abundance of spawning horseshoe crabs in 2021 Swann and Hall (2019).

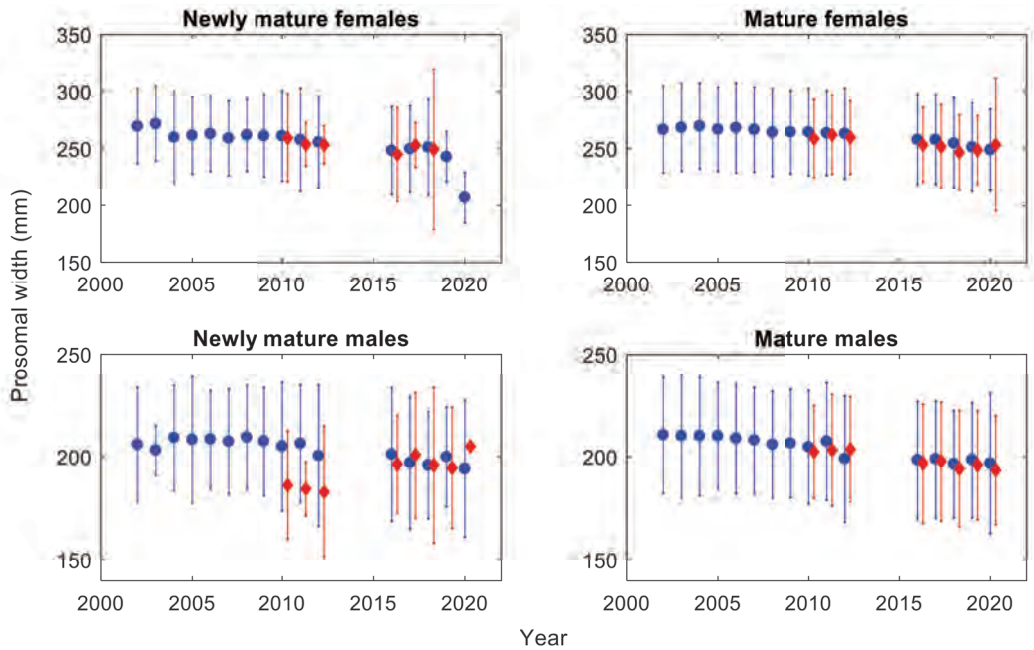


Figure 3: Mean sizes of newly mature and mature female and male horseshoe crabs over 2010 to 2020, with gap years from 2012 to 2015, from the VT survey in the coastal Delaware Bay area (Hallerman and Jiao, 2021).

particularly from 2018 to 2020. Recent low recruitment means that smaller mature females are not compensating for the loss of larger mature females. Consequently, total reproductive (egg) output has likely not improved, which hampers recovery of the HSC and RK populations.

For an individual HSC female, her egg production is directly proportional to individual weight, which is an exponential (not linear) function of prosomal width (Figure 5), as in other species of horseshoe crabs (Chatterji, 1995) and marine species in general (Barneche et al., 2018).

Changes in size distribution of mature females, particularly large HSC females which contribute disproportionately to total egg production due to the exponential increase in weight with size (Figure 6), will reduce population egg production. This was validated for an HSC population by

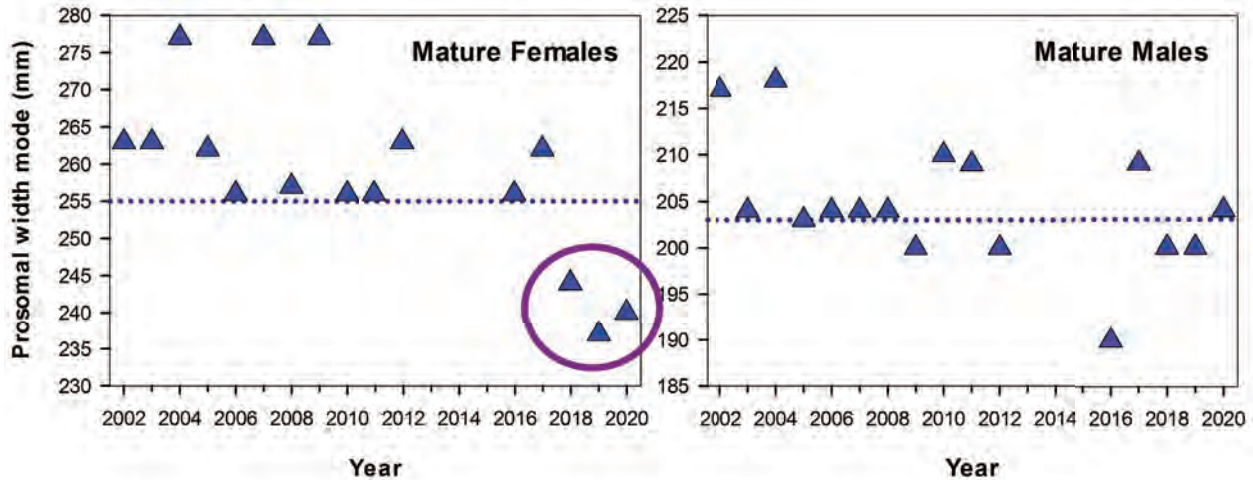


Figure 4: Size modes of mature female and male horseshoe crabs over 2002 to 2020 (gap years from 2013 to 2015) from the VTS in the coastal Delaware Bay area. Mode sizes were estimated from Figures 10 and 11.

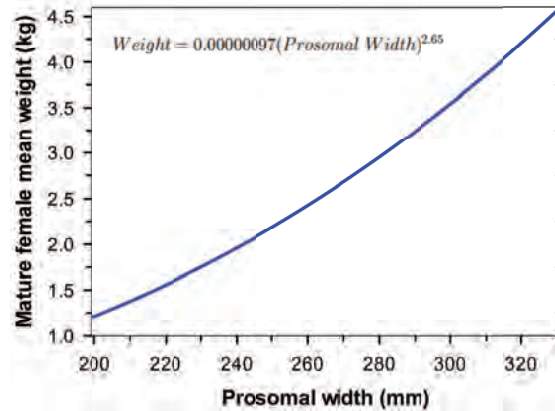


Figure 5: Exponential relationship between mature female HSC weight (kg) and prosomal width (mm) derived from Table 3 in Graham et al. (2009).

Leschen et al. (2006), who concluded that “larger females held a larger number of eggs (63,500) than smaller females (14,500) [and] laid a higher percentage of the eggs they contained. Thus they not only contain more eggs, but are more effective at laying them as well.”

Using only HSC abundance to estimate reproductive output and egg production is ignoring the main biological drivers of population egg production—size structure and biomass (weight)—of the HSC spawning stock. Abundance is a reliable proxy of HSC egg production only if size structure of the spawning stock is unchanged over time, which is not the situation with the HSC spawning stock. Size distribution of mature females has shifted to smaller females (Figures 3 and 4), and recruitment does not account for the recent shift in size distribution because abundance of newly mature and immature females in the past few years has been well below average (Figure 1).

Abundance of females larger than 300 mm prosomal width (i.e. females with the highest egg production) has dropped recently, particularly from 2018 to 2020 (Appendix Figures 10 and 11), which has substantially reduced egg production. Note in Figures 10 and 11 that females larger than 300 mm prosomal width were apparent in 6 of 8 years from 2002 to 2009 (Figure 10), but only in 1 of 8 years from 2010 to 2020 (Figure 11). Moreover, the recent low recruitment means that

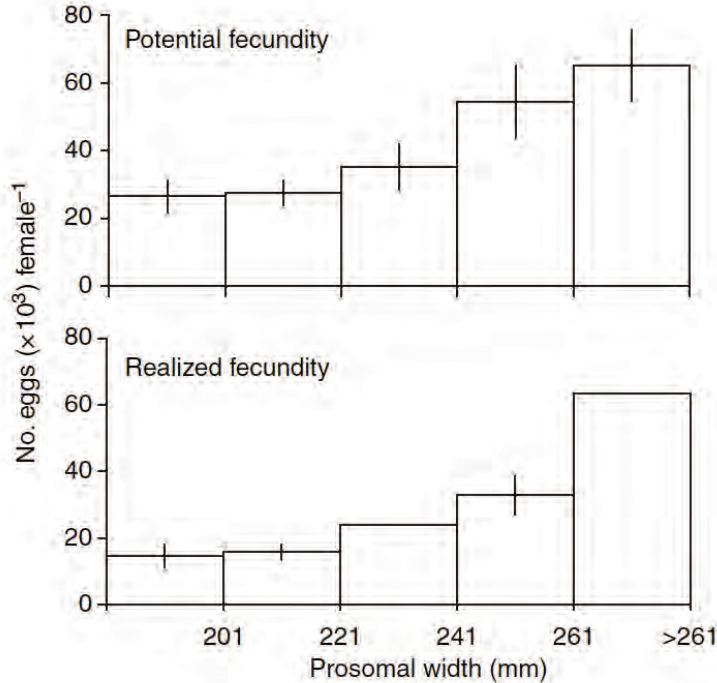


Figure 6: Positive relationship between HSC female fecundity and prosomal width (Leschen et al., 2006).

smaller mature females are not compensating for the loss of larger mature females. Consequently, total reproductive (egg) output has likely not improved, which hampers recovery of the HSC and RK populations.

5.4 HSC Sex Ratio

When HSC harvest has been restricted to males during the prohibition, the ratio of males to females should have decreased. In contrast, male:female sex ratios have actually increased from 1999 to 2019. This represents another warning sign that the current management strategy has not been effective, and that harvest of females should not be increased.

To assess HSC sex ratio over time, particularly since the prohibition on female harvest, I examined sex ratio data from the 2019 Delaware Bay Horseshoe Crab Spawning Survey, Table 5 (Figure 7). The time series shows an initial drop in the ratio of males to females during 2013, shortly after the prohibition on female harvest began. However, the ratio of males to females has increased since 2014 and even reached the highest ratios in the time series during 2018 and 2019.

5.5 High Mature Female HSC Mortality

The combination of discard mortality and bait harvest mortality for females has increased substantially in recent years and is comparable to levels before the prohibition. Assuming that the prohibition has worked is therefore risk-prone. The collective bait harvest and discard mortality is not being controlled effectively and inhibits HSC recovery.

Total mortality of females due to the bait fishery and its discards has increased substantially in recent years and is comparable to levels before the prohibition (Figure 8). Note that there is still a small amount of direct mortality due to the bait fishery (Figure 8), possibly due to inaccurate identification of female HSC by fishers. Thus, the prohibition on female harvest has not been

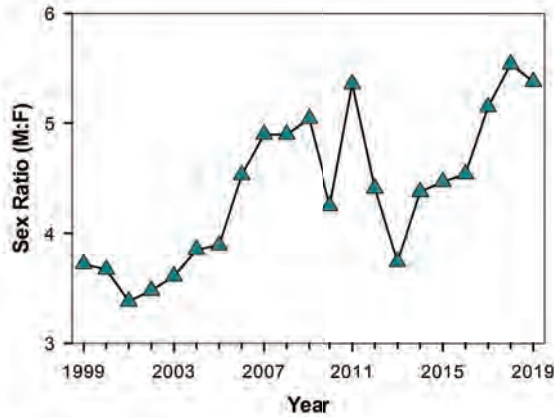


Figure 7: Sex ratio from the Delaware Bay Horseshoe Crab Spawning Survey Swann and Hall (2019).

effective in reducing female HSC mortality, and any further increase in female harvest is risk-prone and a danger to the HSC population and RK recovery.

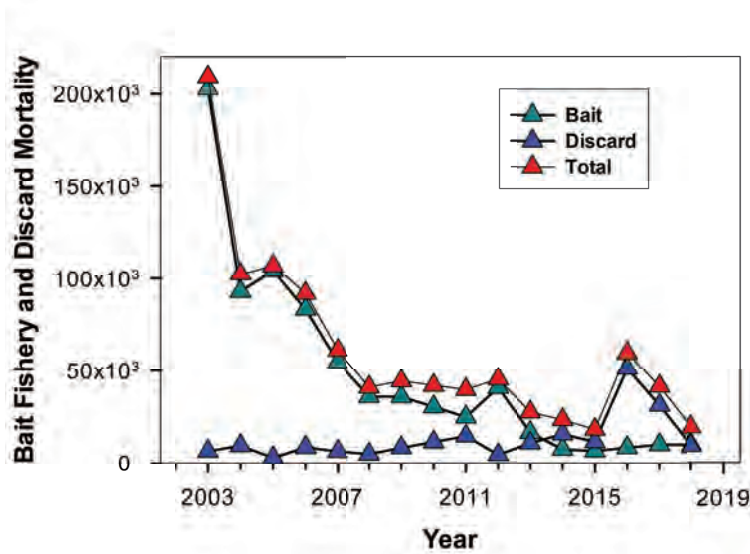


Figure 8: HSC mortality due to the bait fishery and discards (Adaptive Resource Management Subcommittee, 2022).

5.6 Reliance on HSC Density as the Indicator of HSC Population Status

Female density (catch per unit area) is a primary variable used in HSC surveys and the ARM framework model. Reliance solely on HSC density or abundance ignores other variables that commonly produce warning signs about the status of a stock, such as female size, female size-frequency distribution, spawning stock biomass and female:male sex ratio (Free et al., 2020; Punt et al., 2020). These variables are often more sensitive indicators of problems in a population, meaning that they can detect problems more effectively than abundance estimates alone. Hence, the current management strategy is risk-prone by ignoring these more sensitive indicators.

5.7 Low HSC Egg Density

Recent data indicate that HSC egg densities in HSC spawning habitats and RK feeding grounds remain an order of magnitude below densities when RK and HSC were relatively abundant. The ARM process has decided to ignore patterns in HSC egg density because of methodological “uncertainty” in the data. Under conditions where a population is not in danger, this may be acceptable, but absolutely not when it represents a potential warning sign about a population in danger, such as the RK. Thus, lack of use of HSC egg density data, as a proxy for RK food availability, amounts to a failure to incorporate all available scientific information into the analysis to guide management decisions in a risk-averse manner.

To assess changes in HSC egg density over time, I compared data for egg density before the peak of HSC harvest during 1985, 1986, 1988 and 1990 with data after the peak of HSC harvest from 1999 to 2021 (Smith et al., 2022). While the time series from 1999 to 2021 shows egg density increasing from an average of about 3,000 eggs per m² in 2000 to 9,000 eggs per m² in 2021 (Figure 6), egg density remains over an order of magnitude lower than that before the peak of HSC harvest during 1985 to 1990 (Figure 6).

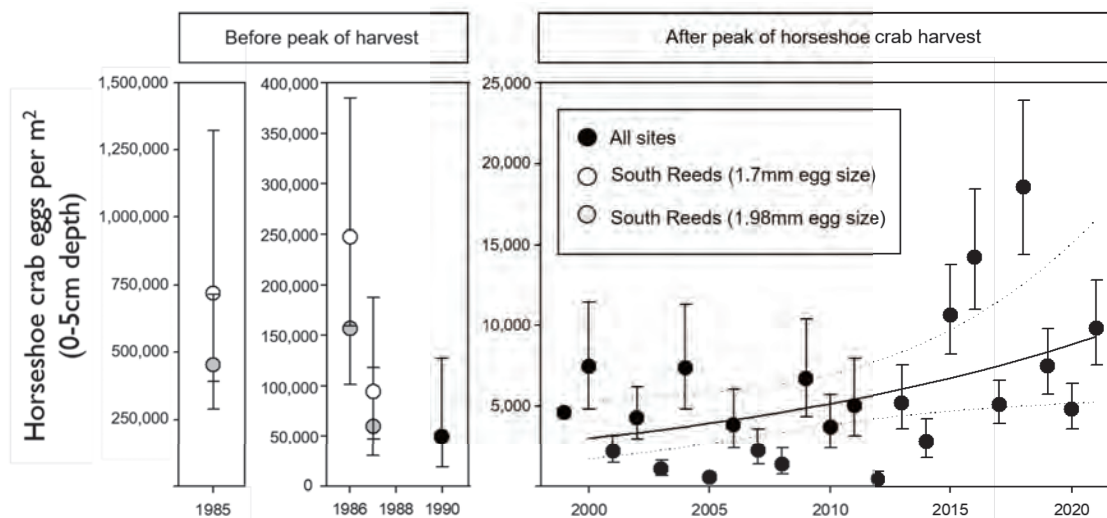


Figure 9: HSC egg density from spawning beaches, emphasizing the order of magnitude lower egg densities in recent years relative to historical levels in the spawning beaches. Note the different range of values in the left and right graphs. Figure from Smith et al. (2022).

5.8 Lack of Correlation of HSC Surveys

Data from the DES and NJS of HSC in Delaware Bay are assumed to be correlated with the VTS and used to fill in survey gaps in the VTS. Survey data when all three surveys were conducted are not correlated, and data from the DES and NJS were relatively higher than that from VTS. These results lead to an overestimation of HSC abundance during VTS gap years, which is indicative of a risk-prone assumption.

To evaluate the assumption of coherence between the three surveys, and justification for use of the DES and NJS in the four years when VTS data were unavailable, correlation between the three surveys was investigated. Data used in the analysis are those in Tables 1 and 2 from Adaptive Resource Management Subcommittee (2022) for indices VTS Multiparous Females, DES Adult and

NJS Ocean Trawl from 2003 to 2012, when indices were available for all three surveys prior to the 2012 prohibition.

Data for female and male HSC abundance from the three surveys were not correlated (Table 1), such that the use of data from two surveys (NJS and DES) to estimate data from the VTS survey during gap years when the VTS did not collect data is invalid. Furthermore, the NJS and DES produced data that were relatively higher than data from the VTS (positive intercepts in Table 1), indicating that the replacement data for the VTS using DES and NJS overestimate HSC abundance from the VTS.

Table 1: Correlation analysis for mature female HSC from VTS, NJS and DES.

Parameter	Estimate	Standard Error	t value	P
<i>Females</i>				
<i>DES as a function of VTS: $r^2 = 0.01$</i>				
Intercept	0.23	0.37	0.61	0.56
Slope	0.02	0.07	0.28	0.79
<i>NJS as a function of VTS: $r^2 = 0.001$</i>				
Intercept	1.96	0.67	2.91	0.02
Slope	-0.01	0.13	-0.07	0.95
<i>Males</i>				
<i>DES as a function of VTS: $r^2 = 0.12$</i>				
Intercept	0.03	0.23	0.12	0.91
Slope	0.02	0.02	1.03	0.34
<i>NJS as a function of VTS: $r^2 = 0.03$</i>				
Intercept	2.25	0.71	3.15	0.02
Slope	-0.03	0.06	-0.52	0.62

5.9 Degraded HSC Spawning Habitat and RK Feeding Grounds

Spawning habitat (e.g. beaches) for HSC and feeding grounds for RK have been lost throughout the stopover range of RK in the Mid-Atlantic. Loss of habitat is an additional stress that demands risk-averse management of mortality sources (e.g. fishing) which management can control. There may be variables that are beyond ASMFC's control, but that means they should be more precautionary with variables they can control, and it's certainly not a valid basis for ignoring warning signs like reduced HSC egg density.

A major threat to horseshoe crab population involves habitat degradation and loss, and is expected to worsen in the future due to sea level rise (Botton et al., 2022). Spawning habitat loss has been significant due to various factors such as shoreline management (e.g. bulkheading), coastal disturbances and sea-level rise (Smith et al., 2017, 2020). In some cases, whole beaches have been lost (Smith et al., 2017). Given that habitat loss is not under control by ASMFC, precautionary management demands consideration of such stressors to the population by control of fishery harvest to compensate for external stressors.

5.10 Appendix Figures

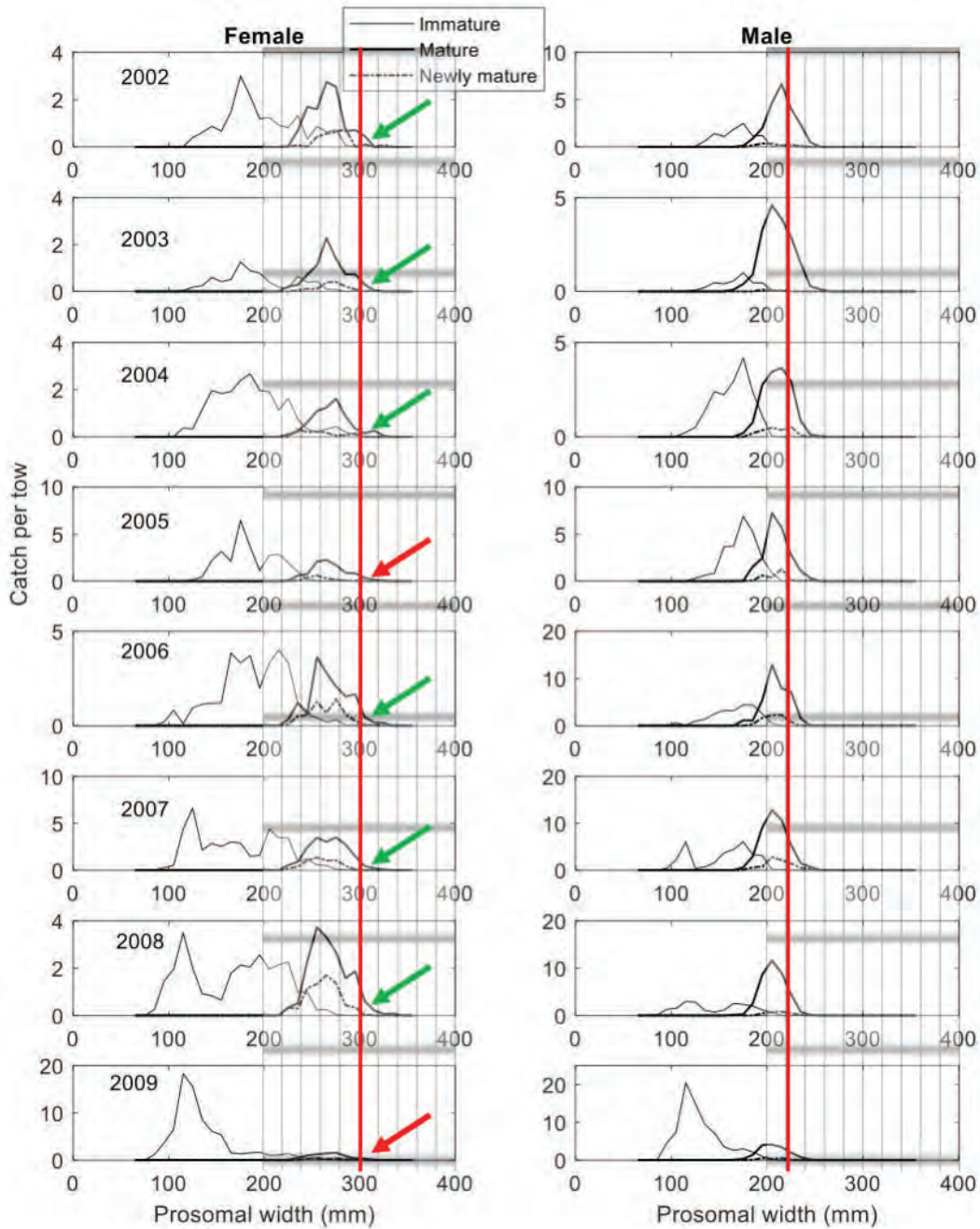


Figure 10: Size frequencies of mature female and male horseshoe crabs over 2002 to 2009 from the VT survey in the coastal Delaware Bay area (Hallerman and Jiao, 2021). Vertical red lines and grid cells were added for reference. Green arrows indicate years when mature females larger than 300 mm prosomal width were apparent, and red arrows when not.

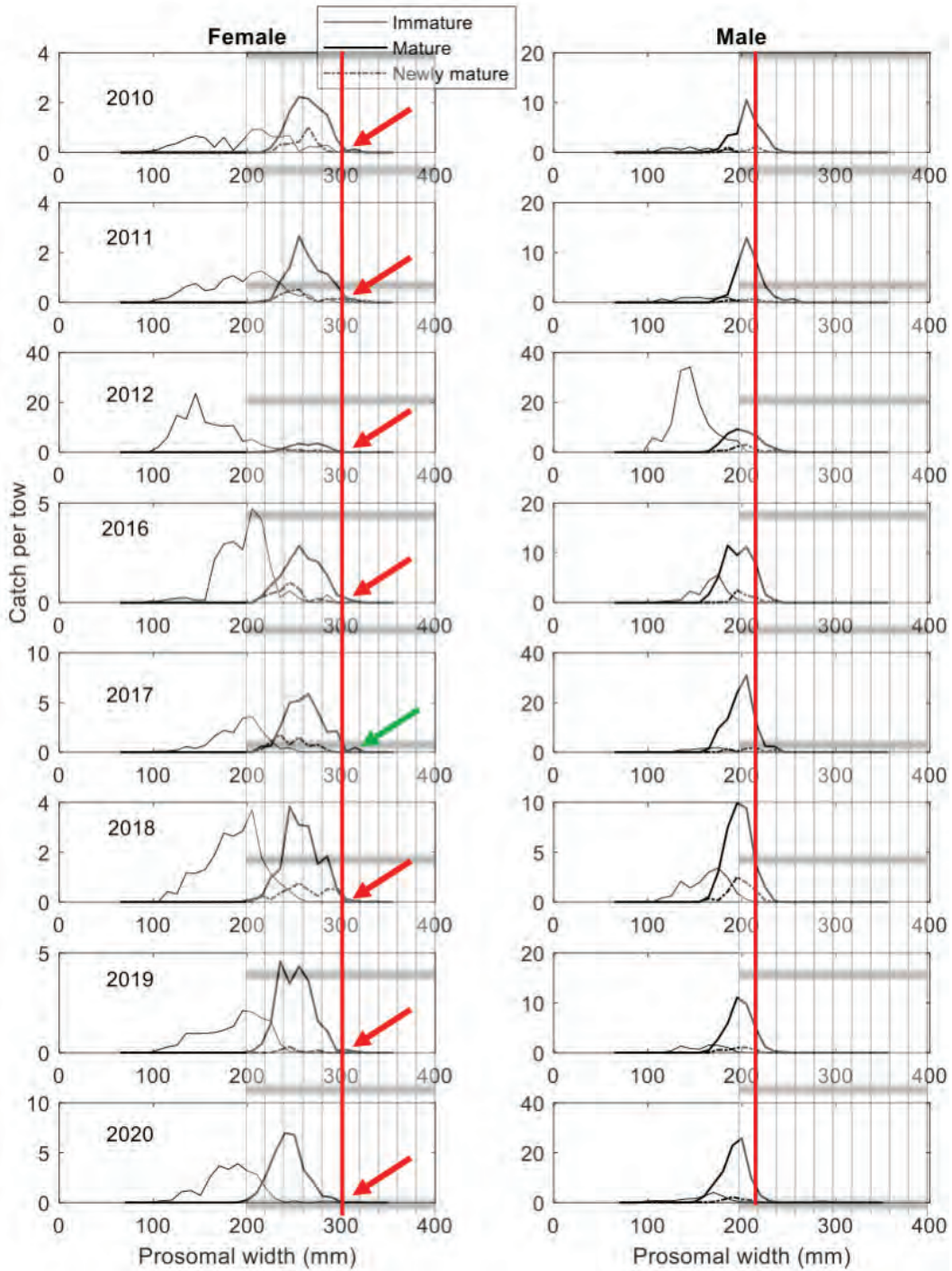


Figure 11: Size frequencies of mature female and male horseshoe crabs over 2010 to 2020, with gap years from 2013 to 2015, from the VT survey in the coastal Delaware Bay area (Hallerman and Jiao, 2021). Vertical red lines and grid cells were added for reference. Green arrows indicate years when mature females larger than 300 mm prosomal width were apparent, and red arrows when not.

6 Acknowledgements

I am extremely grateful to Dr. John Hoenig for his ideas and comments which greatly improved this report.

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8 Qualifications & Credentials

The qualifications, experience and scientific recognition that allow me to provide an informed, expert opinion on this matter are described below. My academic and professional credentials include: Professor (2000-present), Associate Professor (1993-2000), and Assistant Professor (1986-1993) of Marine Science, Virginia Institute of Marine Science, William & Mary, Department of Fisheries Science; Senior Postdoctoral Fellow, Smithsonian Institution (1997-1999); Postdoctoral Fellow, U.S. National Research Council (1985-1986); Adjunct Professor, Anne Arundel Community College (1984-1985); Postdoctoral Fellow, Smithsonian Institution (1984-1985); and Assistant Professor, Florida A & M University (1981-1984; while Ph.D. student at FSU). I received my Ph.D. from Florida State University in 1984 (major: Biological Science; minor: Statistics).

My scientific expertise and research specialties include Marine Conservation Ecology, Fisheries Management, Mathematical Biology, Ecological Statistics, and Ecology and Management of Crustaceans and Molluscs. Over the span of my career, I have 121 publications in peer-reviewed scientific journals, numerous technical reports, and 80 research grants totaling over \$20 million from agencies including the National Science Foundation, National Oceanic and Atmospheric Administration, U.S. Army Corps of Engineers, National Undersea Research Program, Department of Defense, and various others.

I have 45 years of experience with eastern oyster, blue crab, Caribbean spiny lobster, queen conch, Nassau grouper and various marine bivalves; 36 years experience as the Commonwealth of Virginia's expert on blue crab ecology and fishery management; provision of formal opinions to Virginia Marine Resources Commission, Chesapeake Bay Commission, Chesapeake Bay Stock Assessment Committee, and Chesapeake Bay Program Fisheries Goal Implementation Team; 18 years experience as scientific advisor on oyster restoration to U.S. Army Corps of Engineers, NOAA Chesapeake Bay Office, and Chesapeake Bay Program Fisheries Goal Implementation Team; 33 years as Chief Scientist of the Blue Crab Winter Dredge Survey; Co-Principal Investigator of the Blue Crab Stock Assessment in Chesapeake Bay; and member of technical teams for Gulf of Mexico and Chesapeake Bay oyster and blue crab stock assessment, conservation and restoration.

Scientific honors, recognition and awards include: (i) Coastal America Partnership Award from the Executive Office of the President of the U.S., (ii) Kavli Fellowship from U.S. National Academy of Sciences, (iii) Aldo Leopold Leadership Fellow Award, (iv) Outstanding Faculty Award for Advisory Service, Virginia Institute of Marine Science, and (v) Outstanding Faculty Award for Research, Virginia Institute of Marine Science.



September 30, 2022

Atlantic States Marine Fisheries Commission
Attn: Caitlin Starks, Senior FMP Coordinator
1050 N. Highland St., Suite 200 A-N
Arlington, Virginia 22201
comments@asmfc.org

Re: Horseshoe Crab Draft Addendum VIII

Dear Atlantic States Marine Fisheries Commissioners:

On behalf of our 1.7 million members and supporters, the Center for Biological Diversity encourages the Atlantic States Marine Fisheries Commission (ASMFC) to reject the proposed Addendum VIII to the Interstate Horseshoe Crab Fishery Management Plan, which would increase the number of horseshoe crabs harvested for use as bait and potentially reopen the harvest to include female horseshoe crabs.

Populations of male horseshoe crabs and federally threatened *rufa* red knots are well below recovery thresholds. Thresholds are firm minimum requirements that cannot be incrementally and prematurely undercut by increased horseshoe crab harvests.

The Adaptive Resource Management (ARM) model used for Addendum VIII excludes key data, including horseshoe crab egg densities, spawning counts, climate impacts, *rufa* red knot field surveys, ecological carrying capacities, and impacts on other rare and endangered species. The model's lack of transparency and public availability raises significant concerns about its accuracy as well.

Increasing horseshoe crab harvests will jeopardize millions of dollars of investments and decades of dedicated restoration efforts for horseshoe crabs and *rufa* red knots. We urge the commissioners to vote no on Addendum VIII.

I. Horseshoe crab populations have not recovered.

Horseshoe crab harvests rapidly increased in the 1990s. Annual harvests climbed from 100,000 in 1991 to 3 million in 1998.¹ Female horseshoe crabs were especially targeted by commercial fisheries. Because of the dramatic reduction of crabs from the breeding population, horseshoe crab numbers crashed along the Atlantic Coast.

Harvest quotas established in the late 1990s helped to stop the decline, but in the past 25 years, horseshoe crab populations have not come close to recovering. More than 1.2 million horseshoe crabs spawned in the mid-Atlantic in 1990. In 2020, only 335,000 spawned.²

Spawning data provides important insights into the population status of horseshoe crabs, especially since horseshoe crabs do not reproduce until nine years of age. Alarmingly, spawning data was not used in the ARM model. Spawning data is essential in gauging the health and trajectory of horseshoe crab populations and their ability to sustain the federally threatened red knot.

Any increase in horseshoe crab harvests would be premature and would jeopardize decades of restoration efforts and millions of dollars of investments.

The proposed Addendum VIII revision also threatens to resume the harvest of female horseshoe crabs, which would make recovery of the species virtually impossible. Under the current ASMFC framework, there is no female crab harvest until female abundance reaches 11.2 million crabs or until the Delaware Bay total red knot stopover population reaches 81,900 birds. Neither red knot nor horseshoe crab populations are anywhere close to satisfying either metric. Yet under this addendum, female harvest could be allowed.

The proposed Addendum VIII relies on the flawed argument that incremental increases in harvest will not have an impact. In fact, even modest increases in horseshoe crab harvests, especially harvests that include female horseshoe crabs, will likely result in significant declines of horseshoe crabs and horseshoe crab eggs for endangered *rufa* red knots.

Thresholds are established to serve as firm minimum requirements. Incremental increases that occur before these thresholds are met will result in the take of federally listed species.

II. *Rufa* red knot populations have not recovered

The *rufa* red knot (*Calidris canutus rufa*) is a federally threatened migratory bird protected under the Endangered Species Act. *Rufa* red knots rely on the horseshoe crab eggs along the Atlantic Coast to fuel their annual migration. *Rufa* red knots overwintering in Tierra del Fuego

¹ Smith 2017.

² Delaware Bay Horseshoe Crab Survey 2021.

travel nearly 20,000 miles roundtrip each year to and from their breeding grounds in the Canadian Arctic.³

The horseshoe crab eggs along the Atlantic Coast provide a critical source of nourishment. *Rufa* red knots double their body weight during their two weeks on Atlantic coast beaches consuming horseshoe crab eggs. Red knot populations have fallen by 75% since the 1980s, largely the result of overharvesting horseshoe crabs.⁴

Red knot field data shows that red knot populations are at population levels well below the thresholds that led them to being listed as threatened under the Endangered Species Act. In the 1990s, more than 90,000 could be found along Delaware Bay. This year, only 12,000 were counted along the bay, and in 2021, the number was estimated at an all-time low of 6,800.⁵ *Rufa* red knot populations are nowhere close to the recovery threshold of 81,900 red knots established by ASMFC.

Alarming, the ARM model does not include field survey data for *rufa* red knots. The ARM model must include red knot survey data to adequately evaluate impacts of increased horseshoe crab harvests on *rufa* red knots.

Recent studies show that red knots are stopping in Delaware Bay for shorter periods. This could have far-reaching effects on breeding success and survival. Red knots departing from Delaware Bay in higher relative body condition migrate up to a month later than individuals in lower condition, suggesting that the availability of horseshoe crab eggs leads to higher breeding success. Moreover, red knots leaving Delaware Bay with a lower relative body condition had a lower probability of being detected in autumn, suggesting greater mortality compared to individuals with higher relative body condition.⁶

The relationship between horseshoe crab egg availability, red knot feeding behavior, mass gain, and overall fitness is clear. During the Delaware Bay stopover period, red knots track horseshoe crab egg availability. Alternative food resources available during the Delaware Bay stopover, such as blue mussels and coquina clams, do not provide the necessary nutritional content that support rapid and significant mass gain.

As a result, Delaware Bay horseshoe crabs are more important than ever for ensuring the survival and breeding success of *rufa* red knots. *Rufa* red knots seeking food elsewhere will not find any other food sources elsewhere that are as protein-rich as horseshoe crab eggs. And if *rufa* red knots shift their migration patterns further north, there are even fewer horseshoe crabs whose populations are even less stable.⁷

³ USFWS 2014.

⁴ McGowan 2011.

⁵ Delaware Audubon 2022.

⁶ Dujins *et al.* 2017.

⁷ Smith 2017.

More than 90 percent of the *rufa* red knot's diet along the Atlantic Coast is horseshoe crab eggs.⁸ Increasing horseshoe crab harvests, including the harvest of female horseshoe crabs, would directly result in take of federally listed *rufa* red knots.

III. The ARM model lacks key inputs and transparency.

The ARM model used to support Addendum VIII is missing key inputs. The model does not use any spawning count data. The model also fails to include ecological carrying capacity for horseshoe crabs and *rufa* red knots. And the model does not include readily available egg density data. Horseshoe crab egg density is the strongest predictor of *rufa* red knot fitness and breeding success.

In addition, the model fails to include climate impacts on horseshoe crabs and *rufa* red knots, and it fails to evaluate the impacts of increased horseshoe crab harvests on other rare and endangered species that depend on horseshoe crabs and their eggs.

The Center is deeply concerned that the model and its inputs remain unnecessarily inaccessible to the public. This model proposing to increase horseshoe crab harvests cannot be accurately verified without independent analysis. ASMFC seems to be hiding the ARM model behind an unsupported interpretation of the Magnuson-Stevens Act. The so-called Rule of Three clause in the Magnuson Stevens Act was intended to protect individual fishers' locations, not conceal the operations of multinational corporations.

The Center encourages ASMFC to make the model available for independent scientific analysis and public comment as required by law. The model provides the sole basis for Addendum VIII. Without independent verification, his model and its recommendation must be rejected by the Commission.

IV. Horseshoe crab egg density studies are a key dataset that should be central to the model.

Egg density data is the most reliable indicator of the horseshoe crab population, and importantly, is the most valuable index of egg availability for red knots and other shorebirds. Yet ASMFC has never included these surveys in its modeling.

Egg density data is also the most reliable and important indicator of horseshoe crab population health. Horseshoe crabs reach sexual maturity at nine years of age. Population estimates of

⁸ Smith 2017.

horseshoe crabs fail to capture critical metrics, including reproduction success of sexually mature horseshoe crabs and quantity of eggs produced. This data is essential to any decisions regarding horseshoe crab populations, trajectories, and harvests—and their impacts to the federally threatened *rufa* red knot.

Eggs are the nexus between horseshoe crabs and the endangered *rufa* red knot. Egg density is the most important indicator of *rufa* red knot health during its migration. Egg density is also important for the sustenance of endangered sea turtles, shorebirds, terrapins, and fish, including key species of sport fish. Egg density data should be prioritized in the model and the primary basis for decision making.

Based on ongoing field work, including egg density studies conducted by the Delaware Bay Shorebird Project and other organizations, horseshoe crab populations are not recovering from their population crash in the 1990s.⁹ Due to overharvest in the 1990s, egg densities have dropped from 40,000 per square meter to 5,000 per square meter. Over the past 25 years, they have shown little signs of recovery.¹⁰

Poor egg availability on Atlantic Coast beaches results in emaciated red knots and other shorebirds. Declining egg densities on Atlantic Coast beaches increases the red knots' risk of death during their journey. Undernourished *rufa* red knots are also less likely to breed successfully.¹¹

V. Climate impacts to horseshoe crabs and *rufa* red knots are not adequately addressed by the model.

The model and Addendum VIII reflect a lack of understanding of how climate impacts and severe weather will affect crabs and birds.

The model only includes one climate input: Arctic snow cover. While important, this single dataset is insufficient to address the multiple threats of climate change to horseshoe crabs and *rufa* red knots. Sea level rise, hydrologic thresholds, increasing ocean surface temperatures, ocean acidification, extreme weather events, change in seasonal and migration timing, inundation, exposure of horseshoe crab nests, and impacts of increased temperatures on horseshoe crab eggs are just a few of the factors not considered.

VI. The model fails to address impacts to other rare and endangered species.

⁹ Smith 2022 (in press).

¹⁰ Red Knot Recovery Coalition 2021.

¹¹ *Ibid.*

In addition to the *rufa* red knot, endangered sea turtles, terrapins, fish, and shorebirds also rely on horseshoe crabs and their eggs.

The Delaware Estuary is the largest staging area for shorebirds in the Atlantic Flyway and is the second largest staging site in North America.¹² More than 1.4 million migratory shorebirds converge on the Delaware Bay to feed and rebuild energy reserves prior to flying an additional 4,000 kilometers to complete their northward migration.¹³ At least 14 species of migratory birds use horseshoe crab eggs to replenish their fat supply during their trip from South American wintering areas to Arctic breeding grounds. These species make some of the longest known migrations and rely on horseshoe crab eggs along the Atlantic Coast. These bird species include the ruddy turnstone (*Arenaria interpres*), sanderling, dunlin (*Calidris alpina*), and semipalmated sandpiper (*Calidris pusilla*).¹⁴ The semipalmated sandpiper is listed as near threatened by the IUCN Red List and has been declining at a rate of 5% per year.¹⁵

Endangered sea turtles also feed extensively on horseshoe crabs. The NOAA Fisheries Sea Turtle Stranding and Salvage Network identified horseshoe crabs in 75 percent of loggerhead sea turtle (*Caretta caretta*) gut contents.

Diamondback terrapins (*Malaclemys terrapin*)—listed as vulnerable by the IUCN with decreasing populations—also feed on horseshoe crab eggs.¹⁶

In addition, horseshoe crab eggs and larvae are a seasonal food item of American eel (*Anguilla rostrata*), white perch (*Morone americana*), killifish (*Fundulus spp.*), silver perch (*Bairdiella chrysoura*), weakfish (*Cynoscion regalis*), kingfish (*Menticirrhus saxatilis*), silversides (*Menidia menidia*).¹⁷ All crab species and several gastropods, including whelks, feed on horseshoe crab eggs and larvae. Leopard sharks (*Triakis semifasciatum*) have also been documented preying on adult horseshoe crabs.¹⁸

Sport fish, including striped bass (*Morone saxatilis*), summer flounder (*Paralichthys dentatus*), and winter flounder (*Pleuronectes americanus*), feed on horseshoe crab eggs and larvae.¹⁹

VII. Increasing horseshoe crab harvests is not economically justified.

No economic justification exists for increasing horseshoe crab harvests at this time. Male horseshoe crabs rarely bring more than \$1 each, according to the Delaware Division of Fisheries

¹² Delaware Bay Horseshoe Crab Survey 2021.

¹³ Wander and Dunne, 1982.

¹⁴ Lyons 1995.

¹⁵ IUCN 2022.

¹⁶ *Ibid.*

¹⁷ Schuster 1982.

¹⁸ *Ibid.*

¹⁹ *Ibid.*

and Wildlife.²⁰ In addition, the eel and whelk fisheries, which use horseshoe crabs for bait, are already plummeting. Eel populations have declined by more than 50% over the past three decades.²¹ The IUCN listed American eels an endangered species in 2014.²² Whelk populations are also in steep decline due to overharvesting.²³ Massachusetts Division of Marine Fisheries considers channel whelks “to be depleted throughout their range,” and the State of New York recently implemented new limits on whelk harvests.²⁴

Populations of sport fish such as striped bass and flounder also have plummeted—largely because of fewer horseshoe crabs and eggs available.

Overharvesting has depleted key fisheries that depend on horseshoe crabs. Increasing horseshoe crab harvests and potentially including female horseshoe crabs harvest at this time would further jeopardize these fisheries. It also would negate millions of dollars in investments toward horseshoe crab recovery.

Any meager benefits to increasing horseshoe crab harvests would be dramatically outweighed by the costs to taxpayers and ecosystems.

VIII. Any horseshoe crab harvest increases should be postponed beyond 2030 to verify the model’s accuracy and ensure the recovery of horseshoe crab and red knot populations.

The ARM model predicts that horseshoe crab populations will reach dynamic equilibrium within 10 years. If this is accurate, this projection aligns well with the next ARM evaluation scheduled for 2032. No horseshoe crab harvest increases should occur in the next decade. This will allow ASMFC to test the model’s accuracy over the next decade to ensure that horseshoe crab populations and red knot populations fully recover.

Horseshoe crabs are one of the most flagrant and notorious examples of overharvest by commercial fisheries. This resulted in substantial overharvest of horseshoe crabs in the 1990s, and 25 years later, horseshoe crab populations still have not come close to fully recovering.

The dangers of overharvesting are even more significant with the dependence of a federally threatened species on horseshoe crab eggs. Populations of the horseshoe crab and the dependent *rufa* red knot must reach their recovery thresholds before any premature harvest increases are considered.

Over the next decade, we recommend adding spawning surveys, egg density, and *rufa* red knot field surveys to the ARM model. Additional research in the next 10 years can also strengthen

²⁰ ASMFC Public Hearing 2022.

²¹ Haro et al. 2000.

²² IUCN 2021.

²³ Massachusetts Division of Marine Fisheries 2022.

²⁴ NY DEC 2022.

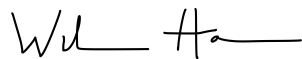
the model. Research is needed to understand the impacts of horseshoe crab harvests on other species, including fish, endangered turtles, and other shorebirds of conservation concern. Research can also help elucidate the impacts of climate change on horseshoe crabs and the species which depend on their eggs.

IX. Conclusion

The Center for Biological Diversity encourages the Commission to abandon this scientifically unsupported proposal and restart the planning process by incorporating datasets that provide a more robust and accurate assessment of the population status of horseshoe crabs and *rufa* red knots. These datasets include readily available horseshoe crab egg density surveys, *rufa* red knot field surveys, additional climate data points, and impacts to other rare and endangered species. It is imperative that the Commission publicly share the model and its inputs to allow independent analysis of its accuracy.

We urge the Commission to vote no on Addendum VIII and postpone any proposed horseshoe crab harvest increases until after 2032 to verify and improve the model's accuracy and to ensure the recovery of horseshoe crab and *rufa* red knot populations.

Sincerely,

A handwritten signature in black ink, appearing to read "Will Harlan". The signature is fluid and cursive, with a long horizontal stroke at the end.

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Testimony to the Atlantic States Marine Fisheries Commission Public Hearing on the Draft Addendum to the Horseshoe Crab Fishery Management Plan

September 19, 2022

Part of this testimony was provided verbally at the DNREC hosted public hearing on the addendum held on SEP 8th, 2022. The testimony provided here was expanded after the hearing.

Introduction and Background

The Center for the Inland Bays is a National Estuary Program responsible for developing and facilitating the implementation of the stakeholder-based Inland Bays Comprehensive Conservation and Management Plan (CCMP). Delaware's Inland Bays are three interconnected Atlantic Coastal lagoons that support a significant population of horseshoe crabs.

The Inland Bays CCMP focuses on reversing eutrophication and restoring key habitats and populations of keystone species such as the horseshoe crab. Water quality of the Bays is highly impaired due to nutrient pollution with some areas experiencing severely degraded aquatic habitat. Baygrass meadows and natural oyster reefs have been nearly eliminated due to disease and pollution. Over a quarter of the estuaries' saltmarshes have been eliminated and marshes continue to degrade due to sea level rise. An important objective of the CCMP is to "to enhance and restore fish populations and their habitats" in part through the advocacy for ecosystem based fisheries management.

The Center also develops and oversees the implementation of the Inland Bays Environmental Monitoring Plan which includes actions related to horseshoe crabs. Since 2008, the Center has conducted the Inland Bays horseshoe crab spawning survey. The survey of five sandy beaches has found the population to be stable and slightly lower than those of the Delaware Bays survey (on the Delaware side). The survey confirms the importance of the Inland Bays as an important spawning area for the crabs. The Center also participates in the USFWS Cooperative Horseshoe Crab Tagging Program. In 2018, the Center used data from the Program to

demonstrate that the Inland Bays population of crabs is indistinct from the Delaware Bay population as a whole (McGowan 2018)¹.

While the Inland Bays do not host the large aggregations of shorebirds found along Delaware Bay, the crabs and their eggs remain an important food source for dozens of economically and ecologically important species of finfish, shellfish, and birds of the estuary.

These comments we provide on the horseshoe crab management plan addendum are consistent with the Inland Bays CCMP.

Comments and Recommendations

Harvest

We commend the ASMFC for including more empirical data from the Delaware Bay into the management model. We acknowledge the remarkable deliberations and analysis that produced the framework revision and research recommendations. And we are thankful for the impressive amount of supporting data collected by a wide variety of agencies with the cooperation of the fishing community and volunteer groups. We acknowledge the direct and indirect economic value of the horseshoe crab fishery and the crab's contribution to the value of wildlife viewing, a healthy ecosystem, and other fisheries. We understand the purpose of the horseshoe management to do the following: *“Manage harvest of horseshoe crabs in the Delaware Bay to maximize harvest but also to maintain ecosystem integrity, provide adequate stopover habitat for migrating shorebirds, and ensure that the abundance of horseshoe crabs is not limiting the red knot stopover population or slowing recovery.”*

Female horseshoe crabs are a particularly important resource for the integrity of the regions' estuaries including the Inland Bays due to their fecundity and egg production. The Center does not support the harvest of female horseshoe crabs at this time due to 1) the observed trends in the overall horseshoe crab population from the Delaware Bay region, 2) the need for more information about the abundance and distribution of horseshoe crab eggs and their relationship with the horseshoe crab population, 3) the potential for the limitation of the red knot's stopover population by horseshoe crab abundance, 4) the lack of understanding how rapidly developing climate impacts including severe weather and spawning habitat change could affect the populations of both crabs and birds.

Trends in the horseshoe crab population

While trends from the New Jersey and Delaware fisheries independent population surveys are clearly increasing, the data from the Virginia Tech survey does not show a clearly increasing trend. All of these surveys are rightly utilized in the model to estimate population. However, only the Virginia Tech survey was designed specifically for the crab. The Center values this as

¹ McGowan, A. Horseshoe Crab (*Limulus polyphemus*) Movements Following Tagging in the Delaware Inland Bays, USA. *Estuaries and Coasts* 41, 2120–2127 (2018).
<https://doi.org/10.1007/s12237-018-0406-7>

the most important survey from a design and analytical approach. Its lack of trend should be valued as a factor in harvest decisions.

Relation of Horseshoe Crab Eggs and Horseshoe Crab Abundance

Counts of horseshoe crab eggs and not the crabs themselves are the most proximate indicator of food for shorebirds and many other predators. In the absence of a long term standardized egg data set, crab abundance should serve as a good indicator of egg availability. However, multiple historical sources of information suggest the occurrence of much higher densities of eggs in the past. The first is an anecdotal account in Goode (1887)² as reported in Kreamer and Michels (2009)³ that describes “deposits of eggs so thick on bay beaches that farmers shoveled them up by the wagonload to use as chicken feed”. The second dataset presented in Smith et al. (2022 *in press*)⁴ suggest egg densities occurred an order of magnitude greater than present day estimates. Both pieces of evidence should be interpreted with caution: the historical account for its qualitative nature, and comparisons drawn in Smith et al. for their lack of a standardized collection method and focus on a single site. However, the evidence is of sufficient value to warrant establishment of a representative program of egg density monitoring for inclusion in the model. This research should confirm the relationship between horseshoe crab numbers and egg density as well as increase understanding of the relationship between egg densities and shorebird abundance. Available data show a moderate increase in egg abundance from 2015 to 2021.

The Center also feels that sufficient evidence exists to suggest that establishment of a baseline horseshoe crab population level near the peak of a second successive overharvest in the late 1990s (following industrial overharvest from the mid 1800s to mid 1900s) could have led to an under-valuation of the ecological carrying capacity of the crab population and its benefits to the integrity of the the region’s estuaries. The stock assessment presents a status of “neutral” for the crab population based upon the index based reference point of the 1998 fishery-independent population survey. Encouragingly, the model suggests that the horseshoe crab population should reach a dynamic equilibrium in about ten years under levels of harvest resulting from the current harvest levels. We request that after ten years of no female harvest the validity of those projections be evaluated in an attempt to ascertain the actual ecological carrying capacity of the region for the crab. This period would also allow another generation of horseshoe crabs to mature. Should dynamic equilibrium become apparent after this period, and the results of additional research on key questions support it, a female harvest should once

² Goode, GB (1887) The fish and fisheries of the United States. Section V. History and methods of the fisheries, Vol II. US Commission of Fish and Fisheries, Washington, pp 652–657.

³ Kreamer, G. and S.E. Michels 2009. History of horseshoe crab harvest in Delaware Bay. Pages 299-313 in J. T. Tanacredi, M. Botton, and D. R. Smith, editors. Biology and Conservation of Horseshoe Crabs. Springer, New York.

⁴ Smith et al. 2020. Horseshoe crab egg availability for shorebirds in the Delaware Bay: dramatic reduction after unregulated horseshoe crab harvest and limited recovery after 20 years of management. Aquatic Conservation: Marine and Freshwater Ecosystems. *In press*.

again be considered. This aligns well with the timing of the next ARM framework revision of the proposed management cycle under Option B.

As colonizers, we have often demonstrated a tendency to unintentionally bottom out a living resource population, as we apparently did with the crab after a century of industrial overharvest for fertilizer and livestock feed. Our proposed approach complements and makes reparations for this overharvest and the one that followed by intentionally allowing the return of the population to its maximum abundance, dynamic as that may be, for the benefit of the entire ecosystem; thus validating the limits of the population on both the lower and upper end, then managing from there.

In the meantime, to provide greater potential benefits to the horseshoe crab fishery additional males could be harvested without impacts to recruitment due to the population's high and stable male to female ratio.

Research

The Center supports the research recommendations of the framework revision that has informed the proposed addendum. While they all have merit, we particularly encourage data collection to support 1) inclusion of egg density into the management model and 2) research on the effects of climate change on spawning and breeding habitat for the crabs and birds.

We also request the development of additional long term research questions to further the ecosystem based management approach in preparation for the next framework revision. The questions should focus on elucidating the predator-prey relationships between crabs (and their eggs) and additional predator species in the Delaware Bay region. We note that these research recommendations appear to be lacking, while the original management plan clearly identifies the importance of continued use of the crab for "other dependent species including fish and wildlife," apparently reaffirmed/restated as "ecosystem integrity" under the current framework. We believe the ultimate goal should be for a dynamic food web model that will estimate the effect of the crab harvest on species in addition to the red knot, thus providing greater information for harvest decisions and tradeoffs. We recognize that this incremental approach would likely require the eventual development of management goals for additional focal species found to be significantly dependent upon the crab under conditions of a rapidly changing environment. At the minimum, this would be particularly important to prevent the management of the crab from falling back to single species management in the instance that the red knot goes extinct; which given the astounding levels of greenhouse gasses in the atmosphere appears very possible.

September 29, 2022

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RE: Horseshoe Crab Draft Addendum VIII

Dear Ms. Starks:

Thank you for the opportunity to comment on the Atlantic States Marine Fisheries Commission's (ASMFC) proposed management options related to the horseshoe crabs on the East Coast. These comments are submitted on behalf of the Board of Directors and members of One Hundred Miles (OHM), a nonprofit, non-governmental organization working to protect and preserve Georgia's 100-mile coast through education, advocacy, and community engagement (OneHundredMiles.org).

We are writing to oppose the use of Draft Addendum VIII, which would implement the 2021 Revision to the Adaptive Resource Management (ARM) Framework. Specific to this comment period, we oppose the adoption of Option 2 supporting changes based on the 2021 ARM Framework, including setting annual bait harvest specifications for horseshoe crabs of Delaware Bay-origin. Additionally, as an active member of the Horseshoe Crab Recovery Coalition, OHM fully supports the comments submitted to you by that organization on September 28, 2022. **Changing the regulations will prematurely remove restrictions on female horseshoe crab harvests and will have a cascading negative affect on many species.**

Georgia's 100-mile coast has a long history of wildlife conservation. Earlier this spring, in partnership with the Horseshoe Crab Recovery Coalition, OHM launched a series of horseshoe crab spawning surveys on barrier islands across the coast. The goal was to collect baseline data of spawning activity during the full and new moon spring tides - information needed to monitor changes in horseshoe crab populations and inform regulations and management decisions.

Altogether, thirty-five volunteers were organized into 29 teams to survey each known spawning area throughout the 100-mile coast. After attending a training session, each group of volunteers were encouraged to visit their assigned sites three times during high tide windows in April and May. Sixty-six individual site surveys were conducted by boat, kayak, and foot. In total, 2777 horseshoe crabs were counted. Most surveyors reported very low numbers, with 35 surveys detecting no crabs at all. This patchy spawning activity is likely due to the highly dynamic conditions of Georgia's coast, where erosional and accretional processes are constantly shifting the coastal bars and barrier islands where crabs are known to spawn.

This year's survey of the Georgia coast was a pilot project. In coming years OHM will work with our partners to expand the research to collect important information regarding HSC spawning, and in future years more egg density studies. The studies critical and demonstrate the important role horseshoe crabs play in the survival of so many species. In particular, the data helps documents the important role horseshoe crab eggs as a primary food source for many other species, including red knot. Each year, over 360,000 migrating shorebirds make their way through Georgia and other Atlanta-coast states in flight to the Arctic—stopping along our coast to refuel

for their journeys. The *rufa* red knot is a critical species that is dependent on both feeding grounds in Georgia and in Delaware Bay.

The ASMFC asserts that there is a less than one-percent chance of a red knot population decline due to the implementation of female harvest under the 2021 ARM Framework revision. Yet the ASMFC has not released the data supporting the increase in female harvest. Making matters worse, ASMFC also does not include the most recent field survey data for red knots, which suggest historically low numbers of red knot feeding through the spring season in Delaware Bay. In the 1990s, more than 90,000 could be found along Delaware Bay during aerial surveys. This year, only 12,000 were counted, and in 2021, the number was estimated at an all-time low of 6,800. This could indicate that red knots are bypassing the Delaware Bay stopover altogether in search of life-sustaining food sources elsewhere. Further, it makes their migratory journey all the more perilous, which could further impact the population recovery. Given this uncertainty in the status of red knot in Delaware Bay, extreme caution should be taken in making any management decisions that could negatively affect them.

Under the current ASMFC framework, there is no female horseshoe crab harvest until female abundance reaches 11.2 million crabs or until the Delaware Bay total red knot stopover population reaches 81,900 birds. The proposed revision would allow the resumption of the female harvest, even though neither the red knot nor female horseshoe crabs of Delaware Bay are close to satisfying either metric.

Field work and studies, including egg density surveys conducted by the Delaware Bay Shorebird Project and other organizations, do not support the assertion that horseshoe crab populations are recovering from their population crash in the 1990s. Egg density data is the most reliable indicator of the horseshoe crab population, and importantly, it is the most reliable index of value for red knots and other shorebirds. Yet ASMFC has never included these surveys in its modeling.

Management decisions that affect endangered species must be scientifically justified and offer the assurance that the changes will have a positive impact on the species. The ASMFC must provide the data and a sound scientific basis before any change to the horseshoe crab bait harvest specification is considered. Allowing for greater numbers of female horseshoe crabs to be harvested all but assures that red knot population levels will never rebound.

Again, we strongly oppose the use of Draft Addendum VIII which would implement the 2021 revision to the Adaptive Resource Management (ARM) Framework. We ask that you adopt the "no action" option and reject the 2021 ARM Framework to set new horseshoe crab harvest standards.

Thank you for considering these comments.

Sincerely,

A handwritten signature in black ink, appearing to read "Alice M. Keyes", with a long horizontal flourish extending to the right.

Alice M. Keyes
Vice President of Coastal Conservation
One Hundred Miles



GENERAL ASSEMBLY
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RE: Comment on Horseshoe Crab Draft Addendum VIII

September 27, 2022

Ms. Starks:

Thank you for allowing us this opportunity to comment on the Horseshoe Crab Draft Addendum VIII currently before the Atlantic States Marine Fisheries Commission (ASMFC).

As a coastal state and the lowest-lying state in the country, Delawareans rely upon a healthy coastal ecosystem and responsible coastal resource management decisions. Not only is this important for our physical and environmental health, but our economic health as well. Our Inland Bays contribute \$4.5 billion yearly into our economy and over 35,000 jobs through tourism, recreation, the real estate market, and our emerging commercial aquaculture industry.¹ Outdoor recreation alone contributes \$202 million yearly into the local economy and supports more than 2,300 jobs.²

All of this is to highlight that a broad ecosystem approach to resource management is imperative. The Adaptive Resource Management (ARM) Framework approach to managing the horseshoe crab bait fishery takes into account population models for horseshoe crabs and the endangered red knot shorebird as there is a special relationship between these species. The objective of the ARM Framework is stated as:

*Manage harvest of horseshoe crabs in the Delaware Bay to maximize harvest but also to maintain ecosystem integrity, provide adequate stopover habitat for migrating shorebirds, and ensure that the abundance of horseshoe crabs is not limiting the red knot stopover population or slowing recovery.*³

¹ Hauser, C. A. and Bason, C. W. (2022). *The economic value of the Delaware inland bays*. Delaware Sea Grant College Program, Delaware Center for the Inland Bays, p.21.

² Id., p. 19.

³ Atlantic States Marine Fisheries Commission (ASMFC). (September 2022). Draft addendum VIII: Implementing recommended changes from the 2021 ARM revision and peer review report [PowerPoint slides]. Retrieved from: <https://register.gotowebinar.com/recording/7478982971381519119>

Our concern is that the ARM Framework is too narrow in its focus and does not approach the issue of what constitutes a healthy population of horseshoe crabs from the right direction. Its concern is largely with maximizing harvest for the commercial fishing industry that uses horseshoe crabs as bait (the conch (whelk) and eel fisheries) while doing no further damage to the crab and red knot populations, not with developing a healthy eco-system made up of many interdependent species. There are many other species, some threatened or endangered like our new state sea turtle, the Loggerhead, and other Diamondback terrapins that depend upon horseshoe crab eggs for their survival. Impacts to the recreational fishing industry, such as a decrease in sport fish like striped bass and flounder, which also depend upon horseshoe crab eggs, should be taken into consideration.⁴ We need to take a more holistic view of what any increase in horseshoe crab harvesting, particularly for females, means to the entire ecosystem. The ARM Framework objective of “maintaining ecosystem integrity” is only meaningful when the entire ecosystem has been taken into account and there is agreement that the current state of the ecosystem is ecologically optimal.

Also, even though the number of horseshoe crabs is stable or slightly increasing, this number is far from where we were in the 1990's when the commercial fishing industry was unregulated, resulting in harvests of over 2 million crabs a year and a decline of about 88% of the species.⁵ We need a better understanding of what our target number of horseshoe crabs in our waters should be and we need to base that target on what is holistically, ecologically optimal while *also* balancing the needs of a sustainable fishing industry.

In addition, we believe that there is important information not adequately accounted for in the ARM Framework related to the mortality of horseshoe crabs associated with vaccine development. Pharmaceutical companies in the United States still primarily utilize horseshoe crab blood in the production of many human medical products such as vaccines, insulin, and intravenous devices.⁶ With the recent increase in the need for vaccines to address the COVID-19 pandemic, the harvesting of horseshoe crabs by pharmaceutical companies and the associated mortality with that practice has also increased. In 2018, the estimated number of horseshoe crabs harvested by biomedical companies for bleeding was 510,407 with a 15% mortality of 77,459 crabs. This increased dramatically in 2020 to 697,025 crabs harvested and a mortality of 106,339.⁷ Given the continued need for vaccine development into the future, the unverifiable nature of the mortality percentage (some estimate this percentage to be closer to 30%),⁸ and the lack of research on the health and fecundity of the female horseshoe crabs after bleeding, we believe that increasing the harvest of horseshoe crabs, particularly females, is unwise.

Lastly, the ARM does not take into account important issues of climate change such as sea level rise and warming water temperature and effects those factors have on the crabs' spawning and survivability, nor any increase in mortality due to increasing storms and their severity. The need to take issues of climate

⁴ Arnold, C. (2020, July 2). Horseshoe crab blood is key to making a COVID-19 vaccine—but the ecosystem may suffer. *National Geographic*. Retrieved from: <https://www.nationalgeographic.com/animals/article/covid-vaccine-needs-horseshoe-crab-blood>.

⁵ Niles, L. J., et al. (2009, January 1). Effects of horseshoe crab harvest in Delaware Bay on red knots: Are harvest restrictions working? *BioScience*, 59(2). [10.1525/bio.2009.59.2.8](https://doi.org/10.1525/bio.2009.59.2.8)

⁶ Maron, D. F. (2022, August 4). Horseshoe crab blood saves lives. Can we protect these animals from ourselves? *National Geographic*. Retrieved from: <https://www.nationalgeographic.com/animals/article/horseshoe-crab-blood--can-save-lives-can-we-protect-these-animals-from-ourselves>

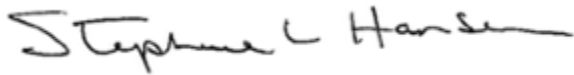
⁷ Id.

⁸ Id.

change into account has been supported by research published in the scientific journal *Molecular Ecology* over a decade ago and presented in *Science Daily*.⁹ Specifically, it was recognized that the population is under threat from over-harvesting for use as bait, by the pharmaceutical industry, and by the destruction of habitats around the beaches that are the breeding grounds for horseshoe crabs, but “the most decisive factor may be future changes in sea level and water temperature.”¹⁰

In conclusion, we believe that ASMFC should revise the ARM Framework to place greater emphasis on the recovery of the horseshoe crab species using an ecosystem-based approach, more closely account for the increasing use of the crabs and the associated mortality in the pharmaceutical industry, and give greater consideration to the effects of climate change on the health and reproduction of the species. Until that analysis occurs, we do not agree that an increase in the harvest of horseshoe crabs is appropriate or that female horseshoe crab harvesting is supported.

Sincerely,



Senator Stephanie Hansen, 10th District



Senator Laura Sturgeon, 4th District



Representative Kimberly Williams, 19th District

cc:

Mr. David Saveikis, DE ASMFC Commissioner (David.Saveikis@Delaware.gov)

Mr. John Clark, Proxy for David Saveikis (John.Clark@Delaware.gov)

Mr. Roy Miller, DE ASMFC Commissioner (fishmaster70@comcast.net)

The Hon. William Carson, DE ASMFC Commissioner (William.Carson@Delaware.gov)

Mr. Craig D. Pugh, Proxy for William Carson (Crabman31@aol.com)

⁹ University of Gothenburg. (2010, October 6). Climate change affects horseshoe crab numbers. *Science Daily*. Retrieved from: <https://www.sciencedaily.com/releases/2010/10/101004101330.htm>

¹⁰ Id.



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September 27, 2022

Comments Regarding the Atlantic States Marine Fisheries Commission's (ASMFC) proposed Addendum VIII Interstate Horseshoe Crab Fishery Management Plan

Caitlin Starks
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Dear Ms. Starks;

Thank you for the opportunity to submit comments on the proposed changes to the Interstate Horseshoe Crab Fishery Management Plan. Manomet, Inc. is a non-profit organization, committed to using science to address pressing conservation challenges, particularly those that impact shorebird populations across the Western Hemisphere. As such, we are writing to explain how we believe the proposed Addendum VIII Interstate Horseshoe Crab Fishery Management Plan has the potential to deleteriously impact imperiled coastal wildlife, particularly shorebirds like the federally threatened red knot (*Calidris canutus rufa*), and the habitats that they depend upon.

The relationship between horseshoe crab spawning and shorebird migration has evolved over millennia. The eggs laid by horseshoe crabs every spring nourish the coastal ecosystem, including Arctic-nesting shorebirds who travel thousands of miles to reach important spawning sites along the US Atlantic coast to feed. Shorebirds are one of the fastest declining groups of birds, with measured losses in many populations of over 50%, and a staggering 94% loss estimated for the population of red knot that depends on the Atlantic Coast since 1970 (Smith et al. in review). Of these shorebirds, long-distance, Arctic-nesting migrants have some of the steepest population declines. Red knots are the most notable, but at least 16 other Arctic-nesting species are also showing significant population declines (Rosenberg et al. 2019). While numerous factors can be attributed to these declines, such as habitat loss and climate change, anthropogenic disruptions to the accessibility of food resources almost certainly impacts the survival of these species. The leading shorebird biologists at Manomet do not think this is a time to be increasing harvest pressure on shorebird food resources.



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There are several important points to consider prior to making any major management decisions that could have far-reaching impacts on coastal ecosystems and potentially catastrophic results for highly imperiled species. These include: 1) metrics that focus on spawning need to be incorporated into the Adaptive Resource Management (ARM) model to better predict how harvest would impact shorebirds, 2) the most current estimates of Red Knot populations need to be incorporated in the ARM model, 3) greater transparency and time for review of data included in the model is critical for balanced decision-making, 4) current population thresholds of horseshoe crabs and red knots have not been met to allow harvest increases, and 5) red knot critical habitat designations need to be included in management decision-making. These points are outlined below.

- 1) The revisions to the ARM model prioritize maximizing horseshoe crab abundance and high red knot abundance. While this would seem to be an ideal win-win scenario, the reality is that there are still many unknowns and variables that the ARM model does not account for, including how climate change is destabilizing red knot populations, and the true impacts of biomedical harvest on horseshoe crabs. While we support implementing an updated ARM model that includes parameters specific to Delaware Bay, and allows for more modern and efficient software, we believe that the commission needs to consider additional information before allowing increased harvest of horseshoe crabs, particularly females. For instance, trawl surveys may not adequately account for how harvest impacts spawning or approximate spawning populations- they simply approximate abundance of crabs offshore along survey routes (Hata and Berkson 2004). Egg density and spawning surveys should be included in the model (Botton et al. 2021), since this is a critical component of the linkage between horseshoe crab spawning density and the ability to support migrating shorebirds (Karpanty 2006).
- 2) The model revision relies on red knot abundance from mark-resight and count data from New Jersey and Delaware from 2011 to 2020, which shows a fairly stable population of approximately 45,000 birds. However, if we look to historic surveys in the 1990s, more than 90,000 red knots were observed in the Bay. Recent spring surveys in 2021 and 2022, which are not included in the data set used in the ARM model revision, showed significant and alarming declines, indicating that there may be additional variability in abundance trends, or even a potential reduction in the population. Surveys this year counted 12,000 red knots, and in 2021 only 6,800-- a historic low number of birds observed. Statistical analysis of red knot numbers for 2020 and 2021 that account for turnover and detection

of marked individuals estimated 40,444 (95% credible interval: 33,627-49,966) and 42,271 (35,948 – 55,210) birds in the larger population (Lyons 2022). These estimates are lower than previous years, and the confidence interval is wider, indicating greater uncertainty. Given these uncertainties and the lower number of red knots estimated, it would be prudent to incorporate more data into modelling efforts.

- 3) All data sets that are used in the revised ARM model should be made available for the review by the public and interested scientific communities. The confidential data surrounding the harvest of horseshoe crabs by the biomedical industry will be added to this model, but the lack of transparency with this source of mortality is of concern beyond the scope of the revisions to the ARM. There is still considerable debate about the true mortality rate linked to biomedical harvest of crabs (Krisfalusi-Gannon et al. 2018); transparent and open reporting could help to alleviate these concerns.
- 4) There are additional concerns that we have with the proposed changes that could result from the addendum. The current framework that exists for the harvest of horseshoe crabs stipulates that there should be no harvest of female crabs until female abundance reaches 11.2 million crabs, or until the total population of Red Knots in the Delaware Bay reaches 81,900 birds. Neither of these criteria have been met, so changes to the harvest regulations would not follow with previously set guidelines. The Integrated Population Model (IPM) that is incorporated into ARM management demonstrates a positive relationship between female horseshoe crab abundance and red knot survival. Given the alarming population declines in red knots, as well as other Arctic-nesting shorebird species which are not represented in the ARM, it would be prudent to continue to move forward with the most conservative harvest recommendations.
- 5) Finally, horseshoe crab harvest activities in the Delaware Bay have far reaching impacts along the entire Atlantic Flyway. Efforts are currently underway by the USFWS to outline critical habitats for red knots to move forward with effective conservation and to reduce population declines. Critical Habitat designation has not been finalized or released by the USFWS yet, and changes to the ARM model, which could result in altering harvest limits, should not be considered until that information is released. While horseshoe crab spawning was not explicitly included in the Critical Habitat designation, the ability of knots to feed in areas that are undisturbed by harvest activity is critical for the success of both migration and nesting. Not only are the numbers of spawning horseshoe crabs impacted when harvesters physically remove them from beaches, but birds are also



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flushed from feeding sites. It is well documented that ample feeding opportunities improved body condition, which influences the chances for a successful migration and even a successful breeding season (Duijns et al. 2017). Therefore, due to the relationship between horseshoe crab spawning and red knot habitat, any changes to the ARM model should not occur until the Critical Habitat Designation process is complete.

Red knots and many other migratory shorebirds are declining at an unsustainable rate. Universal and collaborative action is needed to slow and reverse those declines. The actions of the Atlantic States Marine Fishery Commission could have a significant negative impact on shorebird populations, including the Federally ESA listed red knot. Changes to the existing regulations should only be considered with a more transparent and expansive process to consider other sources of data for the model, as well as incorporating comments from the public and the larger scientific and conservation communities. At this stage, when so much is at stake, we encourage the ASMFC to act in the most risk-averse manner, and follow all the best science available before making major management decisions with far reaching implications.

Thank you for your consideration,

Brad Winn, Vice President
Resilient Habitats





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September 30, 2022

Caitlin Starks, Senior FMP Coordinator,
1050 N. Highland Street,
Suite 200A-N,
Arlington, VA 22201
E-mail: Comments@asmfc.org

Re: Horseshoe Crab Draft Addendum VIII

Dear Ms Starks,

Thank you for the opportunity to comment on the Horseshoe Crab Draft Addendum VIII currently under consideration by the Atlantic States Marine Fisheries Commission (ASMFC).

Audubon Mid-Atlantic (AMA) is one of 22 state and regional programs of the National Audubon Society with more than 71,000 members in Maryland, Washington DC and Pennsylvania. AMA strongly opposes Draft Addendum VII, which recommends raising quotas on the harvest of horseshoe crabs for use as bait by potentially reopening the harvest to include female horseshoe crabs. Our concern is that increasing the horseshoe crab harvest, particularly in the Delaware Bay region, will have negative impacts on the population of the federally threatened *rufa* subspecies of the red knot (*Calidris canutus*), which depends upon an abundance of horseshoe crab eggs as food to fuel its spring migration to its Arctic breeding grounds.

Draft Addendum VIII is a revision to the Adaptive Resource Management (ARM) framework that guides recommendations for the bait harvest of horseshoe crabs in the Delaware Bay region. The current framework (which would be replaced by Draft Addendum VIII) allows for no female crab harvest until female abundance reaches 11.2 million crabs or until the Delaware Bay stopover population of red knots reaches 81,900 birds. Although the population of female crabs has increased in recent years it is still below the 11.2 million threshold. The red knot stopover population in Delaware Bay has not recovered at all since the species was listed as threatened under the Endangered Species Act (ESA), with estimated numbers still approximately 40,000, and the latest counts from 2021 and 2022 indicating sharp population declines. This is clearly not a time to increase the harvest of horseshoe crabs in the Delaware Bay, and further reduce a crucial food supply for red knots.

The recommendation under Draft Addendum VIII to increase the horseshoe crab harvest and allow the taking of female crabs appears to defy both the biological evidence of the lack of recovery in the Red Knot population and the principle of risk aversion adopted by stakeholders in the current ARM framework (Addendum VII). The new proposed ARM framework is based on linked Integrated Population Models (IPM) for horseshoe crabs and red knots, which use

empirical data from the Delaware Bay. ASMFC claims that these models show no effect of horseshoe crab abundance on red knot population recruitment. This model result contradicts the finding by US Fish and Wildlife Service in its Draft Recovery Plan for the *rufa* Red Knot that reduced food availability in the Delaware Bay was the driving factor behind the red knot declines that led to its listing under the ESA. The IPMs may be drawing the wrong conclusion from the fact that a recent increase in the horseshoe crab population has not led to a similar increase in red knot numbers, particularly if the models fail to include data from the earlier years of sharp correlated declines in horseshoe crabs and red knots.

Unfortunately the public cannot evaluate the models used to justify the new proposed harvest regulations for horseshoe crabs because these models are still under review and are being kept hidden from public view. The ASMFC commissioners should certainly not vote to approve Draft Addendum VIII until the models on which it is based have been subject to public review.

The *rufa* red knot is still very much at risk of extinction because its populations have not recovered after the precipitous declines in the 2000s, which were largely due to reductions in a critical food supply. The draft recovery plan for this threatened species includes “safeguarding ample food supplies” as a key element of the recovery strategy for red knots. The proposed recommendations in Draft Addendum VIII run counter to this recover strategy, and will likely propel the red knot faster toward extinction.

Audubon’s 71,000 members in the Mid-Atlantic region care passionately about the present biodiversity crisis and do not want to see the red knot slide toward extinction. We urge the commissioners to vote against the proposed ARM Framework revision.

Sincerely,



David Curson, Ph.D
Director of Bird Conservation (Maryland)



Jim Brown
Director of Policy



Sept 30, 2022

Mr. J. Clarke, Chair
Horseshoe Crab Management Board
Atlantic States Marine Fisheries Commission
comments@asmfc.org

Re: Delaware Bay Horseshoe Crab Proposed Framework Revision – Abandon Effort to Undermine Protections by Allowing Female Crab Harvest

Dear Mr Clarke:

Delaware Riverkeeper Network operates throughout the Basin and is providing this comment on behalf of over 30,000 members. We have helped monitored and tag and rescue horseshoe crabs along the Bay for over 22 years and were a key player in having the red knot listed through the FWS. Any move as indicated by the presentations at the two hearings we were a part of and testified at would be reckless. The ASMFC should not allow the consideration of a female harvest take to the crabs. Its about eggs on the beach in short and the science is not there to allow such a reckless move – by pushing the ARM forward to allow the fishing industry to determine crab fate as early as November is unacceptable.

Horseshoe crabs play a vital role to the Delaware Bay ecosystem, as their eggs provide nourishment for imperiled shorebirds such as the federally threatened red knot. Each year, thousands of red knots fly over 9,000 miles from Tierra del Fuego at the southern tip of South America to breeding grounds in the Arctic Circle. The Delaware Bay is a major stopover point during this long journey, where the red knots feast on horseshoe crab eggs in order to gain the necessary weight to have the energy to make it the remainder of the way to the Arctic Circle. The overharvesting of horseshoe crabs by the bait and biomedical industries has put a severe strain on the ecological connection between horseshoe crabs and red knots. Fewer spawning crabs means fewer eggs and therefore fewer red knots. In 1998, the Atlantic States Marine Fisheries Commission (ASMFC) adopted a fishery management plan for the horseshoe crab harvest. Since the 2013 fishing season, the ASMFC has set harvest quotas using an ARM Framework that links the allowable harvest to the red knot stopover population.

Each year, the ASMFC has selected the same allowable harvest totals based on this framework, which is 500,000 males and zero females. It was agreed that the prohibition on harvesting female horseshoe crabs would not be lifted until the Delaware Bay region hosts at least 81,900 red knots or 11.2 million female horseshoe crabs. Despite the fact that neither of these scenarios has occurred yet, the ASMFC has recently proposed changes that would result in lifting the prohibition on harvesting female horseshoe crabs, further imperiling the food supply for the remaining red knots. This is coming at a time when red knots are far from stable. The average red knot count at Tierra del Fuego for 2018-2020 declined more than 75 percent from average counts in the 1980s and 2000. In 2021, only 6,800 red knots were counted, which is by far the

lowest count since surveys began. By allowing female horseshoe crabs to be harvested, there will be less available eggs and that will put further strain on an already delicate red knot population.

The ASMFC must provide the raw data, modeling, and analysis that justifies the expansion of the harvest of female horseshoe crabs for the public to thoroughly review before any action can be taken. This fundamental change in policy and risk to the recovery of the red knot is being done behind closed doors without robust and engaged public consideration. The interests of the public and other stakeholders cannot be undermined by the short-term fishery interests and lack of precautionary principle by the ASMFC.

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Thank you for your consideration.

Sincerely,

A handwritten signature in blue ink that reads "Maya K. van Rossum". The signature is written in a cursive style with a long horizontal line extending to the right.

Maya K. van Rossum
the Delaware Riverkeeper



PINELANDS PRESERVATION ALLIANCE

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September 27, 2022

Caitlin Starks,
Senior FMP Coordinator,
1050 N. Highland St.,
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Arlington, Virginia 22201

To the Atlantic States Marine Fisheries Commission,

We are writing to urge the Commission to take a more conservative approach to horseshoe crab population management than the proposed updates to the ARM framework would effectuate. We are concerned that the accompanying management implications represent a paradigm shift in how the population is managed that unnecessarily increases the risk to the Rufa Red Knot.

The supply of horseshoe crab eggs in the Delaware Bay is one of the few factors affecting the Red Knot's survival that the State of New Jersey has the power to influence. The ecological connection between these species is inherently valuable and helps to support the local ecotourism industry in southern New Jersey. The overwhelming sentiment from the New Jersey public and our state legislators (see NJ Senate Resolution 67) is that we should adopt the most conservative approach possible. The passage of SR67 indicates that the New Jersey moratorium on female harvest will likely remain in effect, regardless of whatever changes are made to the ARM framework. However, we feel that it is important for the affected states to act in unison to manage our shared resources. We hope that other Atlantic states will join New Jersey by erring on the side of conservation.

For these reasons, we ask that the Commission raise the utility thresholds at which female harvest can be allowed and lower the maximum quota for harvest. We hope that technical updates to the framework can be achieved without abandoning the conservation principles upon which the Commission was founded. To the extent that it is possible, the Commission should further discourage horseshoe crab harvest for both bait and biomedical uses by 1) encouraging states to mandate bait-saving technology by fishermen and 2) urging changes at the national level to make the requisite changes to the US Pharmacopeia that can facilitate the widespread adoption of LAL alternatives in the biomedical industry. Horseshoe crabs and their derivatives have

served an important function in modern society; however, we now have the technology needed to significantly reduce our impact upon this species, as well as the wildlife that depend upon them.

Sincerely,

A handwritten signature in black ink that reads "Heidi Yeh". The signature is written in a cursive, flowing style.

Heidi Yeh, Policy Director
Pinelands Preservation Alliance



HORSESHOE CRAB RECOVERY COALITION

Caitlin Starks, Senior FMP Coordinator

1050 N. Highland Street

Suite 200A-N

Arlington, VA 22201

Email: Comments@asmfc.org

RE: Comment on Horseshoe Crab Draft Addendum VIII

September 28, 2022

Dear Ms. Starks:

As members of the Horseshoe Crab Recovery Coalition, a diverse group of nearly 50 conservation organizations dedicated to ensuring the future of the American horseshoe crab, we vigorously oppose the Atlantic States Marine Fisheries Commission's (ASMFC) proposed Addendum VIII Interstate Horseshoe Crab Fishery Management Plan, which would increase the number of horseshoe crabs harvested for use as bait and potentially reopen the harvest to include female horseshoe crabs.

While the decline in horseshoe crab populations is problematic throughout the Atlantic Coast, further creating concern over cumulative impacts to the species, it is especially concerning along Delaware Bay, given its importance as a horseshoe crab spawning area and a critical stopover for migrating red knots, a Federally threatened shorebird. Several indicators show that both horseshoe crab populations and the population of red knots, that depend on their eggs as a source of food, are well below recovery thresholds.

Therefore, we urge the commissioners to vote no on Addendum VIII.

We base our opposition on three factors:

- We have yet to see the model upon which the proposed revision is based, so there is no way of objectively verifying its accuracy.
- Horseshoe crab populations remain at historic lows, and their ongoing use both for bait and biomedical purposes all but ensures they will not recover to their historic population levels.
- *Rufa* red knot populations are at all-time lows from both a changing climate and the increasing scarcity of the food needed to fuel their 9,000-mile migration.

Among the most worrisome aspects of the proposed addendum is that the public has yet to see the model upon which it is based. Even if granted access at this late date, we do not believe the September 30, 2022, comment deadline would be sufficient time to independently analyze its accuracy. Such a release would serve the interests of science and spur important public debate about your proposed actions and should have been a prerequisite for ensuring fully informed public commenting.

We are also highly concerned that the proposed revision would likely trigger a resumption in the harvest of female horseshoe crabs, which would make recovery of the species virtually impossible. Under the current ASMFC framework, there is no female crab harvest until female abundance reaches 11.2 million crabs or until the Delaware Bay total red knot stopover population reaches 81,900 birds. Neither red knot nor horseshoe crab populations are anywhere close to satisfying either metric, or yet, under this addendum, female harvest could be allowed.

Based on ongoing field work, including egg density studies conducted by the Delaware Bay Shorebird Project and other organizations, we do not see signs that horseshoe crab populations are recovering from their crash in the 1990s (Smith et al. *in press*). The coalition believes that egg density data is the most reliable indicator of the horseshoe crab population, and importantly, is the most reliable index of value for red knots and other shorebirds. Yet ASMFC has never included these surveys in its modeling.

In addition, ASMFC does not include field survey data for red knots, and these data show that red knot populations are at population levels well below the thresholds that led them to being listed as threatened under the Endangered Species Act. In the 1990s, more than 90,000 could be found along Delaware Bay. This year, only 12,000 were counted along the bay, and in 2021, the number was estimated at an all-time low of 6,800. Evidence is now emerging that red knots are stopping in Delaware Bay for shorter periods (Lyons 2022) or could be bypassing the Delaware Bay stopover altogether in search of life-sustaining food sources elsewhere. This could have far-reaching effects on breeding success and survival (Duijns et al. 2017).

The relationship between horseshoe crab egg availability, red knot feeding behavior, mass gain and overall fitness is clear. During the Delaware Bay stopover period, red knots track horseshoe crab egg availability on sandy beaches bay wide and little in the way of alternative food resources are available (Botton et al. 1994, Karpanty et al. 2006). Importantly, alternative food resources available during the Delaware Bay stopover (e.g., blue mussels, coquina clams) do not provide the necessary nutritional substrates that support rapid and significant mass gain (Haramis et al. 2007). Importantly, red knots departing from Delaware Bay in higher relative body condition migrated south up to a month later than individuals in lower condition,

suggesting that the former were more likely to have bred successfully (Duijns et al. 2017). Moreover, individuals leaving Delaware Bay with a lower relative body condition had a lower probability of being detected in autumn, suggesting greater mortality compared to individuals with higher relative body condition (Duijns et al. 2017).

Many of our conservation organizations have sounded the alarm about the global diversity crisis and the specific threats facing shorebird populations, which have plummeted more than 70 percent over the past 50 years. Their declines represent the world's number one conservation crisis facing birds today. Allowing the killing of female horseshoe crabs at this critical moment all but assures that the population of shorebirds like the red knot will never recover.

The joint collapse of red knots and horseshoe crabs is not inevitable. But the draft addendum propels them closer to that grim reality. We urge you to abandon this scientifically unsupported proposal by voting no on Addendum VIII, and instead urge you to begin the process anew by:

- Incorporating into the model datasets that show a more robust picture of population status for horseshoe crabs and red knots, including horseshoe crab egg density surveys and red knot field surveys.
- Publicly sharing the model behind the proposal, allowing for sufficient time for independent analysis before public commenting.

Respectfully signed by members and friends of the Horseshoe Crab Recovery Coalition,

American Littoral Society
Audubon Mid-Atlantic
Audubon South Carolina
Center for Biological Diversity
Charleston Audubon and Natural History Society
Defenders of Wildlife
Delaware Audubon
Delaware Riverkeeper Network
Forest Keeper
Georgia Audubon
Humane Society International
Jenkinson's Aquarium
League of Women Voters of New Jersey
Maryland Bird Conservation Partnership
Maryland Ornithological Society
Mass Audubon

National Audubon
National Wildlife Federation
North Carolina Wildlife Federation
New Jersey Audubon
Revive and Restore
Save Coastal Wildlife
South Carolina Wildlife Federation
Southeastern Massachusetts Pine Barrens Alliance
The Humane Society of the United States
The Safina Center
Wildlife Restoration Partnerships

Smith, J., A. Dey, K. Williams, T. Diehl, S. Feigin, and L. Niles. *In press*. Horseshoe crab egg availability for shorebirds in the Delaware Bay: dramatic reduction after unregulated horseshoe crab harvest and limited recovery after 20 years of management. *Aquatic Conservation: Marine and Freshwater Ecosystems*.

Duijns, S, L.J. Niles, A, Dey, Y. Aubry, C. Friis, S. Koch, A.M. Anderson, and P.A. Smith. 2017. Body condition explains migratory performance of a long-distance migrant. *Proceedings of the Royal Society B* 284: 20171374. <http://dx.doi.org/10.1098/rspb.2017.1374>.

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Karpanty, S.M., J.D. Fraser, J. Berkson, L.J. Niles, A. Dey and E.P. Smith. 2006. Horseshoe crab eggs determine Red Knot distribution in Delaware Bay. *Journal of Wildlife Management* 70:1704-1710.

Botton, M.L., R.E. Loveland and T.R. Jacobsen. 1994. Site selection by migratory shorebirds in Delaware Bay and its relationship to beach characteristics and abundance of horseshoe crab (*Limulus polyphemus*) eggs.



September 28th, 2022

South Jersey Bayshore Coalition
Karla Rossini
CU Maurice River
P.O. Box 474
Millville, New Jersey, 08332

Atlantic States Marine Fisheries Commission
1050 North Highland St.
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Arlington, Virginia, 22201

To whom it may concern:

The mission of the [South Jersey Bayshore Coalition](#) (SJBC) is to preserve the cultural heritage and environmental integrity of the South Jersey Bayshore. The Coalition builds state and local awareness and appreciation of southern New Jersey's Bayshore Region, leading to its protection.

The SJBC strongly opposes the Atlantic States Marine Fisheries Commission's (ASMFC) proposal to reverse the current framework for horseshoe crab management. The ASMFC is proposing to increase the allowable harvest of horseshoe crabs and to lift the longstanding moratorium on the harvesting of females. This proposal contradicts ASMFC's established regulatory precedents, fails to consider relevant data, and ignores the will of local stakeholders.

- Under the current management framework, ASMFC prohibits the harvesting of female horseshoe crabs until the Delaware Bayshore hosts at least 81,900 red knots or 11.2 million female horseshoe crabs. Neither of these quotas have been reached. Nevertheless, the ASMFC is proposing to allow the harvest of female horseshoe crabs and to raise horseshoe crab harvest limits. The reversal of ASMFC's current regulatory precedent will imperil the food supply for red knots and other shorebirds, and destabilize the bayshore ecosystem.
- This proposal fails to consider the most relevant data in its revisions. Red knot counts from Tierra del Fuego for 2018-2020 show a 75% decline in comparison to historic population data gathered between 1980-2000. The proposal also does not consider egg density data, which is the most important indicator for horseshoe crab populations.

- The abandonment of the current management framework and the resulting decline of horseshoe crab and shorebird populations will have a negative impact on overburdened Bayshore communities. Southern New Jersey relies on ecotourism; an industry that generates an estimated \$35-50 million annually in the State. The horseshoe crab spawning season draws large numbers of ecotourists from around the country and the world. According to ReTurn the Favor and tagging program data, well over 15,000 community scientists have visited Bayshore beaches since 2013 to assist in horseshoe crab management projects. In addition, SJBC organizations run many other spring migration outdoor awareness programs; each of them well attended. Program success is a clear measure of community and stakeholder investment in a healthy Bayshore ecosystem.

If the ASMFC implements the proposed changes, Bayshore ecology will be weakened and local economies negatively impacted. For these reasons, the SJBC urges the ASMFC to retain the established management framework, maintain the current limits on horseshoe crab harvesting, and continue the moratorium on harvesting female horseshoe crabs.

Sincerely,

A handwritten signature in black ink, appearing to read 'K. Rossini', with a stylized flourish at the end.

Karla Rossini
Coalition Chair
Karla.Rossini@CUMauriceRiver.org



September 30, 2022

1050 N. Highland St.
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Arlington, Virginia 22201

Ref: Proposed Addendum VIII to Horseshoe Crab Fishery Management Plan

Dear ASMFC Commissioners,

We, a group of individuals dedicated to horseshoe crab conservation, write to urge the Atlantic States Marine Fisheries Commission (ASMFC) to vote against Option B for Addendum VIII which would change the Adaptive Resource Management (ARM) model for horseshoe crab harvest. Using current data inputs, the new model would recommend opening a limited female harvest.

We understand that an update is necessary for the ARM model, as data availability has changed and the modeling software is outdated. We also understand that the Delaware Bay horseshoe crab population is stable and in recent years there has been some evidence of recovery. We even understand that some harvest is necessary to allow watermen access to the bait they need to maintain their livelihoods. However, we are challenged to understand why it is necessary to use a model that recommends female harvest.

As volunteers for reTURN the Favor, a multi-partner program working to rescue overturned or impinged horseshoe crabs stranded on New Jersey's Delaware Bay beaches, we are acutely aware of the vulnerability of the horseshoe crabs. We work to protect the lives of horseshoe crabs and expect a valid mechanism when the mortality of horseshoe crabs is at stake. Addendum VIII does not provide that justification.

Insufficient time and opportunity for review

Several stakeholders, including those with significant statistical expertise, have requested the new models with a Freedom of Information Act request, but it has not been provided. Federal agencies claim that the size and complexity of the new ARM model is the reason it cannot be shared. The confidential data from the biomedical industry are also cited as a barrier to access. However, horseshoe crabs are a public resource, and as the mechanism that provides harvest recommendations, the ARM model needs better opportunity for access and review.

Horseshoe crab numbers have not reached pre-decline abundance.

In the 1990s, there was a rapid increase in horseshoe crab harvesting to supply fisheries with bait. This led to a dramatic drop in the crab population as well as other species that rely on horseshoe crab eggs including the *rufa* Red Knot. Restrictions in the harvest in the early 2000s has helped the population to stabilize and even increase according to the Horseshoe Crab Benchmark Stock Assessment and Peer Review Report.

reTURN the Favor is a collaborative effort that enables organized volunteer groups to save horseshoe crabs stranded on New Jersey's seasonally closed and open beaches.

www.returnthefavornj.org

Increased, but not recovered, the horseshoe crab population has not reached the pre-decline population. The previous ARM model set a threshold of 11.2 million adult female horseshoe crabs, with no female harvest until this population is reached. The new model disregards that number, recommending female harvest before horseshoe crabs reach this carrying capacity, an action that will slow recovery.

Data used in model does not reflect the activity on the beach.

The new model has added biomedical mortality data to the trawl survey data, an important dataset to include. However, the new model does not incorporate any surveys that reflect the actual spawning activity on the beach like the Delaware Bay Spawning Survey data or egg density data. These datasets provide important information on the actual availability of eggs for Red Knots, shorebirds, and other wildlife, as this is the critical variable for the ecosystem. Before changes are made to the model, the concerns with these surveys should be addressed and a model developed that incorporates these data.

Lack of understanding on the potential impacts of climate change to horseshoe crab population.

We currently have very limited understanding of the full impact that climate change will have on horseshoe crab habitat and life cycle. We already know that there will be impacts to habitat from sea level rise and extreme storms as those impacts are actively occurring now. When facing the uncertainty of climate change, resiliency is the key to maintaining ecosystems. We must ensure that all other threats to the species are minimized so the population is strong and capable of recovery when in the face of climate change impacts. A female harvest would greatly reduce the resiliency of the species.

Disregard for investments in restoration and other conservation actions.

Setting the precedent to open a female harvest would undermine the millions of dollars of investments that have been made and continue to be made to protect and restore horseshoe crabs spawning habitat in both Delaware and New Jersey. These investments increased significantly in 2013 to repair beaches after Superstorm Sandy, and large-scale restoration projects have continued since. These projects were determined to be a necessary part of the recovery of horseshoe crabs and Red Knots by federal, state, and local agencies; community members; and conservation partners, specifically because the species is not recovered.

Horseshoe crabs are a critical part of the ecosystem. They also play an important role in the identity of coastal communities. We have dedicated many hours to rescuing horseshoe crabs, because this keystone species is important to us personally. Female harvest would threaten this identity and threaten the core of what makes our communities unique.

We urge that the precautionary principle is observed and Option A approved. Option A reverts back to older harvest recommendations in Addendum VI and is less than ideal, but it is preferred over Option B. We ask that Option B of Addendum VIII is not approved until the ARM model changes have been thoroughly reviewed by the public, include comprehensive survey data, and consider an appropriate threshold population.

Females carry the future of the species – the future for the ecosystem, the future of harvest, and the future for us – the residents and visitors of these coastal communities. The horseshoe crab population is showing some signs of recovery, but it is not fully recovered. It is only on the path to recovery. It is a dangerous precedent to suggest that a female harvest could be reopened.

Sincerely,

Susan Rotella, Villas, New Jersey

Deb Finelli, New Haven, Connecticut

Please leave these beautiful harmless prehistoric creatures alone to live their natural lives on earth.

John H. King, Cape May, New Jersey

Jill Connell, Villas, New Jersey

Stephen Hamersky Jr., Hillsborough, New Jersey

It is time (which is quickly running out) for everyone to stand up for the environment and for endangered life forms, rather than catering to special interests for their selfish short term. Please have the courage to do so.

Eileen Halko, High Bridge, New Jersey

Please help protect the horseshoe crabs.

Joseph C Halko, High Bridge, New Jersey

Bonnie Kolber, Trenton, New Jersey

Wendy Latzgo, Fogelsville, Pennsylvania

I strongly urge you to continue to prohibit the harvesting of female horseshoe crabs and not raise the quotas for males. As a volunteer with Return the Favor and the American Littoral Society, I work hands on with these wonderful creatures, rescuing and tagging them. Currently their habitat is diminishing with coastal erosion and sea level rise. Locals that live in the area tell me the number of crabs has plummeted in their lifetimes. That's why we're doing everything we can to save every one of them. Their future is also unsure with the changes of the ocean ecosystem with climate change. Right now is a critical time for this species. Please do the right thing and keep the quotas as they are.

Amy Vasquez, Burlington Township, New Jersey

Joseph Burger, Forked River, New Jersey

Marcy Fiorentino, Burlington Township, New Jersey

Ruth Bergstrom, Villas, New Jersey

Emily Ochitill, Yorktown, Pennsylvania

Eric Baratta, Beverly, New Jersey

Kevin Knutsen, Barnegat, New Jersey

Diane Lee-Smith, Mansfield, Ohio

Also urge the FDA to approve the use of artificial LAL for testing.

Lisa Burger, Forked River, New Jersey

Allison Anholt, Cape May Court House, New Jersey

John Gfrorer, Wenonah, New Jersey

Please – think about future generations. These majestic creatures need to be around for another 5 million years. Don't be the reason why they disappear.

Barbara Bennett, Jamison, Pennsylvania

Please stop this proposal!

Kathy Horn, Villas, New Jersey

Gail Howarth, Maple Shade, New Jersey

Please do not allow the female horseshoe crab harvest to be reopened. We have worked diligently to save and protect this unique species which is so valuable to our birds, beaches, culture and even our human existence! Thank you.

PATRICIA A HARPER, Cape May, New Jersey

Maranell Estadt, Millville, New Jersey

Judy Pizarro, Maple Shade, New Jersey

Kelly Grassi, Basking Ridge, New Jersey

Ron Smith, Merchantville, New Jersey

For over ten years I have been an active community scientist participating in horseshoe crab rescues on the Delaware Bayshores. During this time our group has rescued over 70,000 horseshoe crabs. We have witnessed storms, tides and many human structures and habitat alterations that pose serious risks to spawning horseshoe crabs. At the same time I have witnessed and participated in restoration, education and collaboration that represents a more optimistic future for horseshoe crabs and the bay ecosystem. Loosening restrictions would only serve to undermine the successes of the last decade and threaten the future of this keystone species.

Faith Zerbe, Drexel Hill, Pennsylvania

Dayalan Srinivasan, Collingswood, New Jersey

The Atlantic horseshoe crab population is simply not ready for the catch limits to be lifted. My hundreds of hours of volunteer time rescuing horseshoe crabs in the Delaware made it clear that egg densities and number of female crabs remain woefully low. This is the time to rededicate to restoring this declining population, not for declaring victory.

Mary Beth Kohler, Mount Laurel, New Jersey

I have been working with Return the Favor NJ to rescue overturned horseshoe crabs for two migrating seasons. Female horseshoe crabs are larger and heavier than males, and from my data, there are fewer of them compared to the amount of males we rescue. Including females in a harvest is a dangerous, short-term measure. Please consider the testimony of those of us who are out there working to help the horseshoe crabs.

Susanna Burlage, Clementon, New Jersey

Denise Marconi, Woodstown, New Jersey

Skip the change and keep the current protections to help protect horseshoe crabs, especially females.

June Karp, Wildwood, New Jersey

As someone who has worked to rebuild the dwindling horseshoe crab population on the Delaware Bay for seven years, I was shocked to learn that the progress we have made could be thwarted and even more shocked that it would target females that the species needs to survive as well as other species in the ecosystem of the bay who utilize their eggs for survival. Not only does research bear this out but common sense tells me that if females are targeted as expendable in any species, their species is considered expendable along with other dependent species. Even to those who chose not to consider the fragility of the ecosystem, this would be a choice to make expendable what the fishing industry appears to need. The outcome of targeting females would be self defeating for the fishing industry without sustainability of the horseshoe crab population.

Robert E. Coifman, M. D., Millville, New Jersey

Karen Thompson, Cape May, New Jersey

Gerry Barsotti, Ocean City, New Jersey

Dennis J. Funaro, Billerica, Massachusetts

We should have learned a lesson with the devastation of the Atlantic Sturgeon in the Delaware. Do not do change the horseshoe crab numbers so that the current efforts to restore the crab numbers can continue.

Patricia A Haines, Pitman, New Jersey

Lynne Riley, Woodstown, New Jersey

This is clearly not the time to reduce protective regulations for horseshoe crabs. So much is at stake.

Andrea Olenik Hipkins, Woodbine, New Jersey

The future of this species and the others it supports rests on those female crabs thus their protection is crucial to survival for humans, red knots and the species itself. Humans are the only ones who can make this happen. Please protect their future and ours.

Robert Hofstrom, Medford, New Jersey

I am one of those individuals who have worked hard to make the horseshoe crab recovery at least a partial success. I hope that those efforts aren't thrown away.

Jill Mortensen, Millville, New Jersey

Please protect horseshoe crabs.

DonaLee Milner, Pitman, New Jersey

Marian Jordan, Linwood, New Jersey

The 'for profit' biomedical request for privacy should not be paramount in this situation. The animals are a public and natural resource that demands a higher level of consideration. Though the animals have been relatively steady in breeding for the past few years, their numbers are far lower than historically. The drop is because of the over harvesting by both marine and biomedical entities. One doesn't value them and uses them as cheap bait for fishing and the other is making so much money from their harvest and poor management of bleeding techniques that they are willing to deplete the population until it crashes - only then will they make use of the synthetic product that is in use in other countries.

Dawn Payne, Woodbine, New Jersey

I think it is imperative to save the horseshoe crabs. We should not be allowing more to be killed, especially the females. The only way their numbers will increase is if every female is able to lay eggs for the next generation. It would be incredibly foolish, near-sighted, and against all common sense to let the females be killed along with males.

Megan Kately, Villas, New Jersey

Guillaume Laurent, Villas, New Jersey

Elzbieta Frydel, Franklinville, New Jersey

Carolyn Richards, Cape May, New Jersey

Devin Griffiths, Ocean View, New Jersey

I find it distressing that the ASMFC is failing to share its data or data models with all affected parties, and that you are considering opening up a female horseshoe crab harvest when the status of both the horseshoe crab and Red Knot populations is tenuous at best. In the face of serious uncertainty and grave threats, prudence and caution must rule the day. Please reject Option B of Addendum VIII.

Amanda Lyons, Wildwood, New Jersey

Kelianne O'Shea, Cape May, New Jersey

Daniel Bruce, Mount Laurel, New Jersey

Victoria Tyran, Franklinville, New Jersey
Wendy Tyran, Franklinville, New Jersey
Maria Delayo, Franklinville, New Jersey
Michelle Piazza, Yorktown Heights, New York
Jeffrey Hipple Jr, Moorestown, New Jersey
Amanda Miduski, Clayton, New Jersey
Melinda Talley, Clayton, New Jersey
Cassandra Vasta, Clayton, New Jersey
Michelle Barbaro, Franklinville, New Jersey
Ruth Maina, Moorestown, New Jersey
Janine Bruce, Mount Laurel, New Jersey
Stacy Milazzo, Moorestown, New Jersey
Kevin Pyles, Blackwood, New Jersey
Monling Li, New York, New York
Mai H., Moorestown, New Jersey
Carol Wyland, Avalon, New Jersey
Please vote AGAINST Option B!

Scott Hearn, Moorestown, New Jersey
Jacqueline Clark, Williamstown, New Jersey
Marta Gancarz, Mooresville, North Carolina
Victoria J Gordon, Palmyra, New Jersey
DEREK FRYDEL, Franklinville, New Jersey
Maria Reyes, Moorestown, Pennsylvania
Angela Trout, Clayton, New Jersey
Lisa Ferguson, Stone Harbor, New Jersey
Ben Eggink, Franklinville, New Jersey
Michele Cole, Marlton, New Jersey
Cole Good, Mullica Hill, New Jersey
Jessi S., Sicklerville, New Jersey
Mason Miller, Franklinville, New Jersey
Carol, Mount Laurel, New Jersey
Kimberly Spiegel, Millville, New Jersey
LAURIE L WILLIAMS, Fortescue, New Jersey
Liz Cowley, Fortescue, New Jersey
Meghan Kolk, Villas, New Jersey

Peter Manzelmann, Mauricetown, New Jersey

Horseshoe crabs are vital to our ecosystem for so many reasons. If we destroy the ecosystem we will be destroyed too. Do not raise the quotas for horseshoe crabs. Thank you.

Olivia Chen, Franklinville, New Jersey

Karla Rossini, Millville, New Jersey

John Custer, Newtown Square, Pennsylvania

Robert C Cowperthwait, Millville, New Jersey

Susan Rossi, Millville, New Jersey

Mary E Wood, Monroe Township, New Jersey

With the red knot population in steep decline, it defies logic to allow more harvesting of horseshoe crabs on which their survival depends. Please do not do this.

Helena Grin, Millville, New Jersey

We must do everything we can to support the diversity of our marine environments. Thank you.

John Newman, Weehawken, New Jersey

Wilma Greisman, Sea Isle City, New Jersey

Adina LoBiondo, Northfield, New Jersey

Janice Molloy, Greenwich, New Jersey

Please save the horseshoe crabs for all

Robin Spurlino, Dowingtown, Pennsylvania

Dennis Palmer, Blackwood, New Jersey

Patricia Rossi, Levittown, Pennsylvania

Martha Torpey, Cape May, New Jersey

Michael Torpey, Cape May, New Jersey

Annette Kissell Nestler, Villas, New Jersey

Health of Our Ecosystem and Horseshoe Crabs must be Maintained!

Thomas Bellia, Mullica Hill, New Jersey

Yes, we rely on a healthy Delaware Bay , the crab and red knots are and integral part of our environment

Donna C Dailey, Millville, New Jersey

Geri Ferrara, Port Elizabeth, New Jersey

Suzanne Hauselt, Cape May, New Jersey

Doreen b Homan, Newfield, New Jersey

Carl k Homan, Newfield, New Jersey

Susan Whitehouse, Elmer, New Jersey

Cheryl Fox, Franklinville, New Jersey

Jessica WoodKelley, Philmont, New York

Laura Chamberlin, Chestertown, Maryland

Vicki Dodson, Baltimore, Maryland

Kathleen M Haines, Pitman, New Jersey

Gabriele Schmitt, Bergenfield, New Jersey

I am very concerned that harvesting of Horseshoe Crabs will be increased, putting not only their population at risk but all the shore birds that depend on the crabs' eggs for their survival.

David Golden, Egg Harbor, New Jersey

Susan M Miles, Bryan, Pennsylvania

Jan Dwyer LoBiondo, Vineland, New Jersey

Our environment continues to be at risk and yet we as the stewards of its gifts like the pollinators, the endangered species, the plants and food sources need legislative support. The data speaks clearly to me: read the scientific data and devote energy to guarantee this earth to our children and grandchildren. That is why I volunteer to Return the Favor with my CU Maurice River team from mid May to mid July and also cook for 20+ International scientists who devote time and travel to gather that important and current data on horseshoe crabs and red knots. PLEASE READ THE DATA. Please do not threaten the horseshoe crabs. Please do not threaten the red knots. Thank you for reading. I'm putting my faith IN YOU.

Elaine Whitaker, Avalon, New Jersey

Erin Oswald, Hammonton, New Jersey

Bette McCarron, Ocean City, New Jersey

Joan Lawrence Rhoads, Millville, New Jersey

Leave the female horseshoe crabs to spawn. The crabs all already at a great life cycle disadvantage, taking females will further deplete the population resulting fewer crabs for all Bird and Human Resources.

Lisa, Williamstown, New Jersey

Clay Sutton, Cape May Court House, New Jersey

The ecotourism value of the crabs is far greater than the fisheries value!

Carolyn Quinn, Gibbsboro, New Jersey

Lisa McDeemott, Mauricetown, New Jersey

Lee Varian, Princeton, New Jersey

John McDermott, Mauricetown, New Jersey

Matthew Stock, Egg Harbor, New Jersey

Erik Mollenhauet, Pitman, New Jersey

Jackie Kehrmann, Richland, New Jersey

John Wojtowicz, Bridgeton, New Jersey

Diane Salek, Nutley, New Jersey

Elizabeth Daversa, Plainfield, New Jersey

Marla Jimenez, Millville, New Jersey

Susan Linder, Woodridge, New Jersey

Eileen Epley Wiggins, Mauricetown, New Jersey

Lisa McNichol, Avalon, New Jersey

Horseshoe crabs are integral to the successful migration of many birds. Reducing their numbers would significantly impact their migration.

Pamela W Hull, Bernardsville, New Jersey

In our increasingly fragile world,, a vote against Option B of Addendum Vlii is critical.

Stephen Byrne, Fortescue, New Jersey

Please don't. Maybe later when the numbers are good...

Lisa Stewart Garrison, Bridgeton, New Jersey

We've worked so hard to achieve horseshoe crab recovery but we are not there yet. Voting against Option B and incorporating surveys of spawning activity and egg density into the new ARM model is the prudent and sensible course of action for ASMFC to take at this time.

Meghan Martin, Bridgeton, New Jersey

Cathy Davies, Millville, New Jersey

Mr. Anthony Klock, Port Norris, New Jersey

This makes zero sense! No!

Cynthia Staehle, Vineland, New Jersey

There is no good reason whatsoever to harvest horseshoe crabs.

Joan Deckman, Barnegat, New Jersey

Peter Deckman, Barnegat, New Jersey

Diana Deckman, Basking Ridge, New Jersey

As someone in research and sustainable supply chain management, I respect the balance of advancement, supply, and resourcing. We know too much to put our heads in the sand. Do the right thing and listen to your experts early and often.

Susan Cobb, Moorestown, New Jersey

Lenore Tedesco, Stone Harbor, New Jersey

Horseshoe Crabs should be recognized as the keystone species that they are for the entire ecosystem that should far outweigh their value as bait. More information needs to be included in population models to more appropriately account for their role.

Joan J. Purchase, Cape May Court House, New Jersey

The amount of horseshoe crabs must improve.

Sandra Anderson, Vineland, New Jersey

Humans have depleted the numbers of these incredible creatures for years. We have to try and reverse the damage we have already done. Please save them - they have already saved us and continue to do so with their amazing blue blood. Strictly monitor the blood harvesting companies and raise the fines and penalties for illegally harvesting them. Thank you.

Ellen Pedersen, Vineland, New Jersey

Horseshoe crabs have not sufficiently recovered to change harvesting, please don't change the ARM management.

Susan Michniewski, Hopewell, New Jersey

Jeanne Parkinson, Millville, New Jersey

Rita Barthold, Millville, New Jersey

I join CU Maurice River and the South Jersey Bayshore Coalition in opposing the Atlantic States Marine Fisheries Commission's proposal to reverse the current framework for horseshoe crab management.

Stacey Staman, Williamstown, New Jersey

Lynn Parker, Stratford, New Jersey

George d. Howarth, Maple Shade, New Jersey

First, I disagree with using/killing living creatures for fertilizer, especially Horseshoe crabs. Second, our watermen do not need to use Horseshoe crabs as bait to catch EIs to be used as delicacies for other countries. Third, there is a silicone that can be used effectively for medical purposes instead of Horseshoe crab blood. Lastly, Opening the harvest of female Horseshoe crabs makes even less sense to me especially since neither the male or female population has reached the pre-decline numbers. We need to protect these unique and purposeful creatures. Thank you for your time and consideration.

Mark Werley, Greenwich, New Jersey

Priscilla Bonsell, Hatfield, Pennsylvania

Please protect the female horseshoe crabs.

Judith Davis, Elmer, New Jersey

Sally B Conyne, Stockton, New Jersey

Jessica Davis, Doylestown, Pennsylvania

ROBERT DANIEL ROSSI, Levittown, Pennsylvania

Marie Victor, Villas, New Jersey

Patrick March, Doylestown, Pennsylvania

Protect horseshoe crabs. Many species, including our own, depend on them.

Rebecca Pedersen, Buena, New Jersey

Kathleen Hooper-Milositz, Bethlehem, Pennsylvania

Kenneth Foulke, Warminster, Pennsylvania

Elizabeth Loyle, Millville, New Jersey

Mary Ann Smith, Fort Washington, Pennsylvania

Females horseshoe crabs carry the future of the species – the future for the ecosystem and the future of harvest. The Red Knot depends on her eggs to put on the necessary weight it needs to migrate to its nesting ground. The number of Red Knots have already declined dramatically and are threatened for its survival.

Sharon Furlong, Trevose, Pennsylvania

Now is not the time to allow anything except preservation of this and related species. period.

Phyllis Rosenbaum, Warminster, Pennsylvania

Diann Ewan, Millville, New Jersey

Kathleen Fitzgibbon, Pipersville, Pennsylvania

Catharine Flaherty, Elmer, New Jersey

Kathy Klusman, Douglassville, Pennsylvania

David Kutish, Chalfont, Pennsylvania

Will Stollsteimer, Keene, New Hampshire

Anne Meibohm, Lafayette Hill, Pennsylvania

As a biostatistician as well as a citizen interested in conservation of endangered species, it is important that the model be reviewed by external statisticians. Also there are synthetic alternatives instead of horseshoe crabs for the biomedical industry (PLoS Biol. 2018 Oct; 16(10): e2006607.)

Jewel Rufe, Perkasio, Pennsylvania

Barbara Kristina Beck, Quakertown, Pennsylvania

Please vote against Option B for Addendum VIII which would change the Adaptive Resource Management (ARM) model for horseshoe crab harvest.

Vinobha Karthik Panner Selvam, Warrington Township, Pennsylvania

Let's save horseshoe crabs and Delaware bay!

Patrick McNamara, Media, Pennsylvania

Conservation efforts are showing positive returns, don't stop the effort too soon.

Kerry Loux, Langhorne, Pennsylvania

Tim McFadden, Southampton, Pennsylvania

Larissa Smith, Cape May Court House, New Jersey

Barbara Stollsteimer, Newtown, Pennsylvania

Susan A Harrison, Morrisville, Pennsylvania

Saving the planet - one species at a time.

Anne Poole, Pemberton, New Jersey

John L. Wheeler, Ocean View, New Jersey

Gregory Staman, Williamstown, New Jersey

Action towards bettering our environment and the species within it is a priority for all of us, and we need to approach these issues responsibly.

Edward R. Bonsell, Hatfield, Pennsylvania

Please don't increase the number of Horseshoe Crabs allowed to be harvested until their numbers return to historic levels. Some things are worth more than money. We need our migratory birds. Thankyou, Edward R. Bonsell

Rachel Adler, Morrisville, Pennsylvania

Kathy Pearce, Bensalem, Pennsylvania

Philip Stollsteimer, Newtown, Pennsylvania

Susan Sherman, Doylestown, Pennsylvania

It's bad enough that you want to increase the taking of Horseshoe Crabs, but taking the females is the worst thing you can do. It will all but guarantee the collapse of the Red Knot and other shorebird populations that depend on their eggs to fuel their migration. If there are no eggs when the birds arrive, exhausted and all but starving, they will be unable to make the rest of their journey, and as a result will die off.



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September 22, 2022

Public comment on the Atlantic States Marine Fisheries Commission's Draft Addendum VIII to the Horseshoe Crab Fishery Management Plan: Implementation of the 2021 Adaptive Resource Management Framework Revision

The Wetlands Institute has a long history of stewarding the Delaware Bay population of horseshoe crabs (*Limulus polyphemus*) through programs in research, conservation, and education. Since 1991, our staff and volunteers have contributed annually to the Delaware Bay spawning surveys and, since 2013, we have organized hundreds of volunteers to rescue nearly one million stranded horseshoe crabs on Delaware Bay beaches in New Jersey through the reTURN the Favor program. Our staff monitor birds, reptiles, and fish that inhabit southern New Jersey and depend on a robust population of horseshoe crabs. We engage and educate our membership, visitors, and surrounding communities in this work through public programs, field trips, and school group programs.

The horseshoe crab population plays a critical role in the resiliency of the Delaware Bay ecosystem. Threatened and at-risk species from near and afar rely on the eggs deposited by spawning horseshoe crabs amassed on Delaware Bay beaches during critical life history stages. Famously, red knots (*Calidris canutus rufa*) make a hemispheric journey to nesting grounds in the Arctic aided by a stopover on the Delaware Bay to gorge on abundant and accessible crab eggs. Local breeding fish, crabs, birds, and reptiles consume these eggs, creating ecological linkages of impact that extend far beyond the Delaware Bay. Though the connection and value of horseshoe crab eggs to a multitude of species is clear, the extent and repercussions from a reduced population of horseshoe crabs are not fully understood. Incorporating additional data, particularly annual measures of horseshoe crab egg densities, would strengthen the models for potential impacts of horseshoe crab harvest to numerous species fueled by their eggs.

The Wetlands Institute supports updates and improvements to the Adaptive Resource Management (ARM) modeling approach, inputs of new data, and continuation of multispecies management models proposed in Addendum VIII revisions, however safeguards are lacking for the uncertainty inherent in the population models that underpin the ARM model, and in the ARM model itself. These uncertainties extend to the recommendations in the proposed revision to horseshoe crab management in Amendment VIII. While the proposed adaptive management cycle will provide opportunity to improve the models over time, disclosure of data inputs and threshold setting is critical for initial stakeholder support and precautionary approach for untested revisions in the revised framework. Further, prior thresholds set for female horseshoe crabs (11.2 million individuals) and *rufa* red knot (81,900 individuals) have not been reached and should not be disregarded in Addendum VIII.



Finally, public concern that prompted the original ARM and Amendment VII persists. Strong concern for the population of horseshoe crabs, critically low population levels of *rufa* red knot and other long-distance migratory shorebirds, and the health of the Delaware Bay ecosystem as it faces increasing threats from rising sea level and climate change are top concerns among The Wetlands Institute's staff, volunteers, and community members.

For these reasons, The Wetlands Institute opposes Option B of the Revised Addendum VIII. We ask that Option A of the Revised Addendum VIII be adopted until the Atlantic States Marine Fisheries Commission addresses these concerns to aid the recovery of the Delaware Bay population of horseshoe crabs and health of the Delaware Bay ecosystem.

Sincerely,

A handwritten signature in cursive script, appearing to read "Lenore Tedesco".

Lenore P. Tedesco, PhD
Executive Director



Delaware
Ornithological
Society

PO Box 4247
Wilmington, DE 19807

September 30, 2022

Caitlin Starks, Senior FMP Coordinator
1050 N. Highland Street
Suite 200A-N
Arlington, VA 22201
Email: Comments@asmfc.org

RE: Comment on Horseshoe Crab Draft Addendum VIII

Dear Ms. Starks:

The Delaware Ornithological Society (DOS) is an all-volunteer, 501(c)3 nonprofit representing hundreds of members in Delaware and adjacent states. Our mission is the promotion of the study of birds, the advancement and diffusion of ornithological knowledge, and the conservation of birds and their environment. Our small grassroots organization has helped lead collaborative conservation efforts for bird habitat over the past decade, raising well over half a million dollars in private matching funds for habitat acquisition through our annual Delaware Bird-a-Thon fundraiser, working with our State and NGO partners to leverage these funds to help purchase habitat along the Delaware Bayshore.

DOS opposes the adoption of Draft Amendment VIII to the Horseshoe Crab FMP and urges the Horseshoe Crab Management board to adopt the No Action alternative at this time, based on the following concerns:

Inappropriate Management Objectives / Harvest Functions for Ecological Integrity

While we appreciate the tremendous amount of effort that has gone into the ARM Revision process (especially moving the model from a software-package based approach to open source and industry standard R programming environment, which should make public review and future model revision easier), we have significant concerns about the adoption of the Revised ARM to set harvest quotas for horseshoe crabs. The revised ARM model has a number of important flaws, the most critical being that it does not include as a management objective the timely increase of either the horseshoe crab (HSC) or *rufa* Red Knot (REKN) populations toward any metric related to an estimate of ecological carrying capacity, as the original ARM had done.

In fact, rather than estimating carrying capacity (as the previous ARM did, albeit from limited data and literature) and setting as a goal a metric related to that estimate, this model seeks only to achieve a long-term equilibrium in HSC that would actually be significantly *lower* than the current model-based female population estimates for Delaware Bay. (7.3 million female HSC at ARM projected equilibrium vs. the current population estimate of 9.4 million female HSC) (Figure 15 of Supplemental Peer Review Report). This equilibrium point in the projection would have no real relationship to the concept of ecological integrity. While we appreciate that the prior carrying capacity estimate from the original ARM was based on limited data, we find it extremely concerning that the *objective* of meeting 80% of an estimated carrying capacity for DE bay area

HSCs has been abandoned in the Revised ARM and by extension the Proposed Draft Addendum and that this change in objective has been couched in terms of improved science, when it is in fact a change in management philosophy. The Peer Review Panel echoed this when they stated that “The new utility and harvest functions are a representation of values.” The fact that the original ARM model involved a so-called “knife-edge” threshold vs. continuous harvest recommendation is not a valid reason for a major change in the philosophical underpinnings of the model with respect to ecological integrity. In fact, the knife-edge concern is not at all relevant when the Revised ARM projection levels out at over 2 million fewer female crabs than currently estimated.

The Revised ARM model would have allowed female HSC harvest throughout recent years even though female HSC abundance is positively correlated with REKN adult survivorship ($\beta_1 = 0.37$ 95% CRI: 0.12, 0.6) in the model, thereby unnecessarily extending the timeline to REKN population rebound. Given the Red Knot stopover population trend uncertainty described below, and with the increasingly unpredictable effects of climate change on both survival and recruitment, no avoidable delay in recovery of this federally Threatened bird is acceptable.

ARM Model Uncertainties and Narrow Ecological Lens

The valid scientific concerns about the data upon which the model is based have been detailed extensively by others. We remain concerned that the only HSC-specific trawl survey, the VA Tech Swept Area survey, indicates a less robust population rebound than the DE and NJ trawl data. It is also our understanding that the unpublished study by Smith et al. for egg density at a NJ site shows similar general trends to the VA Tech trawl survey for the corresponding time frame (Arnstead per comm.).

Important methodological concerns brought up with the ARM by the peer review panel must be carefully considered prior to adopting the Revised ARM. E.g. “The Panel noted the estimated primiparous and multiparous HSC abundances have large uncertainties for 2012-2015 when the VT data are not available. In particular, the primiparous estimates for these years are not reliable, potentially introducing large uncertainties (and biases) in the projection model and ARM. The Panel agrees that such uncertainty will be reduced when more years of survey catch data become available in future.”

Just as important, while the concept of the ARM model for multi-species adaptive management was a great start a decade ago, that foundation should have been built upon by incorporating into the model available population data for other migratory shorebirds of conservation concern that heavily utilize HSC eggs on migration stopover, including Semipalmated Sandpiper, Sanderling, and Ruddy Turnstone (Tsipoura and Burger 1999). If this is not currently possible a more conservative approach to selecting acceptable HSC population endpoints is warranted to account for the importance of HSC eggs to bird species of concern other than the Red Knot, as well as other important aquatic species in the food web supported by the keystone HSC.

Red Knot Population Uncertainty

Recent shorebird project mark/recapture data has shown extremely wide variance in 95% confidence intervals for the actual REKN population estimates due in part to reduced banding and resighting effort during the COVID pandemic. “While the number of birds detected in 2021 was similar to the number detected in 2020, this number of individuals resighted within a season is

lower than recent (pre-COVID-19) years given the limited use of volunteers for safety reasons. The number of marked birds detected and available for analysis in 2021 was approximately 48% lower than the number in the 2019 analysis (n = 3,072 birds) and 58% lower than the number detected and used for analysis in 2018 (n = 3,820)" (Lyons 2021).

This reduced *n* value for resighted birds, perhaps also due to reduced resighting probability associated with apparently shorter stopover times (Lyons 2021), has resulted in 95% confidence interval widths for the Red Knot stopover population estimate of 16,339 and 19,262 for 2020 and 2021, respectively, the first time since the model began that CI width exceeded 7,000 in two successive years (<7,040 in 7 of the prior 9 years from 2011 to 2019). At the same time, the lower end of the confidence interval for the population estimate dipped well below 40,000 birds for the first time since the initiation of the model (2013 was the only other year with a CI endpoint below 40,000).

The Draft Addendum states that "If Option B is selected, implementation of the ARM Framework Revision would likely occur for the 2023 fishing season" We feel that it is highly imprudent to implement female HSC harvest at a time when we have some of the poorest recent data on the REKN population, with 95% Confidence Intervals spanning 40-45% of the population estimate. This is unacceptable data upon which to base an increase in female HSC harvest under any circumstances.

Failure to Incorporate Climate Change

While the Revised ARM model includes an input for Arctic snow cover on the Red Knot breeding range, it does not include any other climate related inputs (such as trends in water temperature, etc.) and it cannot account for stochastic events related to climate change, such as storm events.

In fact, the Peer Review Panel recommended that the WG "Evaluate the effect of climate change on horseshoe crabs and red knots. This includes the effects of warming temperatures, sea level rise, and storm frequency and intensity on the timing and duration of spawning, movement of crabs into and out of Delaware Bay, and effects on spawning habitat."

With the rapidity of current climate change, harvest should remain appropriately conservative until this research has been initiated and relevant data is available. Opening female harvest while REKN populations are not recovered, and with a known significant possibility of stochastic events that may affect HSC spawning and/or REKN survival is not a conservative approach to managing this sensitive resource.

Limited Stakeholder Engagement

As stated in Draft Addendum VIII, "A goal of the ARM Framework is to transparently incorporate the views of stakeholders along with predictive modeling to assess the potential consequences of multiple, alternative management actions in the Delaware Bay Region." However, this ARM revision was conducted with minimal outreach effort to stakeholders and did not incorporate the views of conservation stakeholders in determining acceptable model endpoints and harvest functions. We agree with Walsh who states in her minority report that "The proposed new utility function [harvest function as corrected by the PRP] substitutes very different values and risk

attitudes under the umbrella of technical updates, outside of a forum for meaningful stakeholder input and absent any process to solicit updated stakeholder viewpoints.”

The Peer Review report states that “the Panel also understands the inability of the WG to convene a truly representative group of stakeholders for this revision, and therefore also recommended the WG use the outcomes of the sensitivity analyses to confirm the harvest function itself does truly represent the previously-articulated desires of stakeholders from the original ARM Framework (2009).” We would argue that revisiting stakeholder desires is a necessary aspect of the ARM Revision, because of turnover in stakeholder representatives and the tremendous amount of additional data and information available to those stakeholders over the past decade. Stakeholder values and opinions change over time and basing harvest functions being presented to the public on stakeholder input from 12 years earlier is questionable at best. There is no reason that the ASMFC HSC WG could not have virtually/remotely convened stakeholders to inform what amounts to major changes in harvest philosophy and values within this revision.

In summary, we urge the ASMFC Horseshoe Crab Management Board to select the No Action alternative at this time. It would be imprudent at present to open a female HSC harvest in Delaware Bay and the ARM should be revisited with broad ecological sustainability and population restoration goals in mind, and with significantly increased public and stakeholder engagement in the process, in keeping with the ARM objectives.

Sincerely,

A handwritten signature in cursive script that reads "Matthew Sarver".

Matthew Sarver, DOS Conservation Chair

Literature Cited

Lyons, J.E. 2021. *Red Knot Stopover Population Size and Migration Ecology at Delaware Bay, USA, 2021*. A report submitted to the Adaptive Resource Management Subcommittee and Delaware Bay Ecosystem Technical Committee of the Atlantic States Marine Fisheries Commission. <https://documents.dnrec.delaware.gov/fw/Shorebirds/Lyons-2021-REKN-Stopover-Pop-Size-at-Del-Bay.pdf>

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**THE HUMANE SOCIETY
OF THE UNITED STATES**

September 28, 2022

Atlantic States Marine Fisheries Commission
1050 N. Highland St., Suite 200 A-N
Arlington, Virginia 22201
comments@asmfc.org

RE: Horseshoe Crab Draft Addendum VIII

Dear Commissioners,

As a member of the Horseshoe Crab Recovery Coalition, the Humane Society of the United States (HSUS) stands in strong opposition to the Atlantic States Marine Fisheries Commission's (ASMFC) plan to change its Horseshoe Crab Fishery Management Plan, a move that would raise quotas on the killing of horseshoe crabs for use as bait by potentially reopening the harvest to include female horseshoe crabs.

With the absence of the underlying data which supports the new draft addendum being released to the public, conservation groups and concerned citizens have no way to truly understand the science on which the new proposal is based.

HSUS is gravely concerned that allowing female horseshoe crabs to be harvested will have a significant impact on the federally threatened red knot and other shorebirds that depend on horseshoe crab eggs during spring migration stopovers in Delaware Bay, which will put them at risk of further population decline.

In addition, HSUS has an overarching concern about the continued reliance on a component of horseshoe crab blood, *Limulus amoebocyte lysate* (LAL) for endotoxin testing of medical products. Horseshoe crabs are taken from the wild, drained of a portion of their blood, and released back into waterways after they are bled. However, studies have shown that at least 10-15% of the crabs die as a result of this process. With effective synthetic and human cell-based alternatives to this type of endotoxin testing, there is no scientific need to continue the biomedical use of horseshoe crabs.

With horseshoe crab populations at historic lows due to biomedical use and the harvest of horseshoe crabs as bait, opening up the possibility of female horseshoe crabs being killed for bait is misguided and puts the red knot population in further danger.

Due to these reasons, HSUS opposes the proposed plan to increase the killing of horseshoe crabs which are a vital part of the Atlantic coast ecosystem and remain a critical food source and means of survival to the red knot and other shore birds.

Respectfully,

Vicki Katrinak
Director, Animal Research & Testing



WHSRN Executive Office
P.O. Box 1770
Manomet, MA 02345
United States

30 September 2022

Atlantic States Marine Fisheries Commission
1050 N. Highland St.
Suite 200 A-N
Arlington, Virginia 22201

Ref: Proposed Addendum VIII to Horseshoe Crab Fishery Management Plan

Dear ASMFC Commissioners,

On behalf of the Executive Office of the Western Hemisphere Shorebird Reserve Network (WHSRN) I write to urge the Atlantic States Marine Fisheries Commission (ASMFC) to vote against Option B for Addendum VIII which would change the Adaptive Resource Management (ARM) model for horseshoe crab harvest. Using current data inputs, the new model would recommend opening a limited harvest of female horseshoe crabs.

WHSRN is a site-based shorebird conservation initiative launched in 1985 whose mission is to conserve shorebirds and their habitats through a network of key sites across the Americas. The network is comprised of hundreds of partners working at 114 sites in 18 countries to conserve and manage over 38 million hectares of critical habitats for shorebirds.

Delaware Bay, WHSRN's first site, is one of the most important sites for shorebirds in the Americas, especially for the *rufa* Red Knot (*Calidris canutus*) as horseshoe crab eggs on beaches provide important food during spring migration that covers 9,000 miles from southern South America to the Arctic. In the 1990s, there was a dramatic decline in horseshoe crabs in Delaware Bay which led to a subsequent dramatic decline of the shorebirds that rely on horseshoe crab eggs for food. This was one of the factors that led to the *rufa* Red Knot's listing as threatened under the Endangered Species Act. This critical connection between horseshoe crabs and shorebirds is not just true at Delaware Bay, but also at other spawning beaches along the entire Atlantic coast of the United States, including four other WHSRN sites. Without horseshoe crabs in spring, there are very few options for shorebird refueling from Florida to New England.

Due to concern about horseshoe crab recovery, reTURN the Favor (RTF) was founded in 2013 to

address the mortality of adult horseshoe crabs while spawning. Coordinated by the WHSRN Executive Office, The Wetlands Institute, and seven other organizations, this large-scale citizen science project has volunteers walk transects of spawning beaches, rescuing horseshoe crabs that have been stranded, overturned, or trapped in natural or manmade impingement hazards. In the past ten years, nearly 940,000 horseshoe crabs have been rescued by volunteers in over 5,500 walks and over 18,500 volunteer hours. This massive effort illustrates the passion and dedication that local residents and visitors have for Delaware Bay, horseshoe crabs and shorebirds. These volunteers recognize that each crab is an invaluable part of the ecosystem, and especially the females which can carry 80,000 eggs each, and they are honored to play a small part in their conservation. They expect a harvest to be managed with the same goal of recovery first and foremost.

While we support implementing an updated ARM model, there is a need to incorporate additional data sets and to use new modeling software. We have several concerns with the proposed model:

Insufficient time and opportunity for review

Several stakeholders, including those with significant statistical expertise, have requested the new models with a Freedom of Information Act request, but it has not been provided. Federal agencies cite the size and complexity of the new ARM model as the reason it cannot be shared. Additionally, confidential data from the biomedical industry are another barrier to access. Horseshoe crabs are a public resource and the mechanism that provides harvest recommendations needs sufficient opportunity for access and review.

Horseshoe crab numbers have not reached pre-decline abundance.

Restrictions in the harvest in the early 2000s stabilized the population, and it has even shown an increase in recent years, according to the 2019 Horseshoe Crab Benchmark Stock Assessment and Peer Review Report. Increased, but not recovered, the horseshoe crab population has not reached the pre-decline population. The previous ARM model set a threshold of 11.2 million adult female horseshoe crabs, with no female harvest until this population is reached. The new model disregards that number, recommending female harvest before horseshoe crabs reach this carrying capacity, an action that will slow recovery.

Data used in model do not reflect the activity on the beach.

The new model has added biomedical mortality data to the trawl survey data, an important dataset to include. However, the new model does not incorporate any surveys that reflect the actual spawning activity on the beach, such as the Delaware Bay Spawning Survey data or egg density data. These datasets provide important information on the actual availability of eggs for Red Knots, shorebirds, and other wildlife, as this is the critical variable for the ecosystem. Before changes are made to the model, the concerns with these surveys should be addressed and a model developed that incorporates these data.

Lack of understanding on the potential impacts of climate change to horseshoe crab population.

There is currently limited understanding of the full impact that climate change will have on horseshoe crab habitat and life cycle. Loss of suitable spawning habitat is already occurring each year due to sea level rise and extreme storms. Climate change could also bring changes to water temperature and it is unknown how these changes will impact horseshoe crabs through each phase of their life cycle. When facing the uncertainty of climate change, resiliency is the key to maintaining ecosystems. It is necessary to ensure that other threats to the species, like harvest, are minimized so the population remains strong and capable of recovery when faced with climate

change impacts. A female harvest would greatly reduce the resiliency of the species.

Disregard for investments in restoration and other conservation actions.

Setting the precedent to open a female harvest would undermine the millions of dollars of investments that have been made and continue to be made to protect and restore horseshoe crab spawning habitat in both Delaware and New Jersey. These investments increased significantly in 2013 to repair beaches after Superstorm Sandy, and large-scale restoration projects have continued since. These projects were determined to be a necessary part of the recovery of horseshoe crabs and Red Knots by federal, state, and local agencies; community members; and conservation partners, specifically because the species is not recovered.

Aside from local Delaware Bay restoration, many countries along the Atlantic Flyway have made significant investments in habitat restoration, management, and protection to ensure that they are providing the best habitat for shared species. They have made these investments because communities across the Americas receive cultural and economic benefits from a diverse ecosystem that includes shorebirds especially the *rufa* Red Knot. One of the most important things that the United States can do to contribute to this international effort is ensure an energy-rich habitat for spring migration.

The WHSRN Executive Office urges that the precautionary principle be observed and Option A approved. Option A reverts back to older harvest recommendations in Addendum VI and is less than ideal, but is preferred over Option B. We recommend that Option B of Addendum VIII not be approved until the new ARM model has been thoroughly reviewed by the public, incorporates spawning and egg density data, and includes an appropriate threshold population.

Sincerely,

A handwritten signature in blue ink, appearing to read 'RPC', with a long horizontal line extending to the right.

Rob P. Clay, Ph.D
Director, Executive Office
Western Hemisphere Shorebird Reserve Network
rclay@manomet.org



MARYLAND ORNITHOLOGICAL SOCIETY

September 21, 2022

Attention: Caitlin Sparks
Atlantic States Marine Fisheries Commission
1050 N. Highland St. Suite 200A-N
Arlington, VA 22201

SUBJECT: Horseshoe Crab Draft Addendum VIII

Dear Commissioners,

The Maryland Ornithological Society (MOS) is grateful for the opportunity to comment on draft Addendum VIII to the Atlantic States Marine Fisheries Commission (ASMFC) Interstate Horseshoe Crab Fisheries Management Plan.

MOS is a statewide nonprofit organization established in 1945 and devoted to the enjoyment, study and conservation of birds, with special focus on birds which spend all or part of their lives in our state. Currently we have 15 chapters and approximately 1,800 members. Birding is one of the nation's fastest-growing outdoor recreational activities; new birders come from all backgrounds and age groups.

We conduct annual trips to Delaware Bay to observe the shorebird migration, during which the Red Knots are among the most cherished species. We have been saddened by the decrease in their numbers in recent years. But this year's survey of the Red Knot's populations on its staging grounds along the Delaware shore revealed a precipitous decline of this epic migrant species. Last year's Delaware Bay count yielded only 6,880 birds while this year saw 12,000, both down precipitously from the more than over 90,000 that were recorded in the 1990s¹.

MOS is strongly opposed to the adoption of draft Addendum VIII. Our opposition is based on the following.

1. The Addendum would increase the harvest of crabs for bait and could allow the resumption of a female crab harvest. This is despite the numbers of crabs being low and those of the red knot being at record lows. Under the existing ASMFC, no females can be harvested until there are 11,200,000 such crabs or when there are 81,900 red knots on the Delaware Bay. Neither number has been reached, but the proposed Addendum VIII could still allow the harvest of female crabs. This counter-intuitive action would be based upon an updated version of the Adaptive Resource Management Framework (ARM), about which we have concerns.

2. We are concerned that the updated ARM does not rely upon crab egg densities, the most directly relevant measure of the nutritional potential of the crab population to the red knots². Nor does it use data from field surveys of red knots, the most reliable measure of their numbers.
3. The data used by ARM is not open for public inspection, we are therefore being asked to accept its conclusions without knowing how they were derived. In particular these conclusions are so counter-intuitive (especially that the probability that implementing the ARM would result in reduced numbers is <1%), that we cannot accept them without knowing their basis.
4. The tone of the addendum is that all will be well with crab and red knot numbers and that we should not worry.

The bait and medical industries should strongly consider easing up on their crab harvests to allow crab populations to rebound. Failure to reign in these harvests could result in the loss of both the crabs and knots. It would be tragedy if the Red Knot went the way of the Passenger Pigeon and the Eskimo Curlew.

We respectfully, recommend that ASMFC take the following steps:

- i) Release the data underlying the ARM for public inspection.
- ii) Incorporate data on crab egg densities and surveys on red knot number in the next version of the ARM.
- iii) Delay a decision on Addendum VIII until a reasonable time after actions 1) and ii) have been taken.

Yours sincerely,



Robin Todd, PhD

Conservation Chair

Maryland Ornithological Society

10174 Green Clover Drive

Ellicott City, MD 21042

410-313-8154

robintodd1948@gmail.com www.mdbirds.org

¹ Hurdle, J. Delaware Bay no longer a global hotspot for shorebird migration? 2022/ NJ Spotlight News (<https://www.njspotlightnews.org>)

²Karpanty, S.M., J.D. Fraser, J. Berkson, L.J. Niles, A. Dey and E.P. Smith. 2006. Horseshoe Crab eggs determine Red Knot distribution in Delaware Bay. *Journal of Wildlife Management* 70:1704-1710.



September 30, 2022

To: Caitlin Starks, Fishery Management Plan Coordinator
Atlantic States Marine Fisheries Commission
1050 N. Highland St. Suite 200A-N Arlington, VA 22201
Email: comments@asmfc.org

From: Southeastern Massachusetts Pine Barrens Alliance, Inc.

Re: Horseshoe Crab Draft Addendum VIII

Dear Ms. Starks and Members of the Atlantic States Marine Fisheries Commission:

The Southeastern Massachusetts Pine Barrens Alliance (SEMPBA) is an all-volunteer group dedicated to conserving and restoring what remains in Massachusetts of the once vast Atlantic Coastal Pine Barrens.

Since 2018, SEMPBA volunteers have participated in the Massachusetts Department of Marine Fisheries Spawning Horseshoe Crab Survey. Through this program, we have developed a high regard for these ancient creatures, but we have grown alarmed in discovering that horseshoe crabs, which once covered Massachusetts' beaches in such great numbers that communities paid bounties to rid beaches of them, have now become a rarity on most of these same beaches.

Our concerns extend beyond Massachusetts to every state along the Atlantic coast where migrating birds stop to feed on horseshoe crabs. Therefore, SEMPBA appreciates the opportunity to comment on the proposed Addendum VIII to the horseshoe crab Interstate Fishery Management Plan. However, we do not support Addendum VIII and are writing to urge the Atlantic States Marine Fisheries Commission (ASMFC) to reject Addendum VIII.

SEMPBA is of the opinion that the ASMFC should rethink the taking of horseshoe crabs in Delaware Bay and elsewhere for any purposes other than biomedical until the Commission develops a coordinated, coastwide monitoring and regulatory management plan that includes all the states along the Atlantic Coast, and until horseshoe crabs return in numbers great enough to effect an increase in migrating bird populations to pre 1990 levels and the Red Knot is no longer listed as "threatened" under the Endangered Species Act.

SEMPBA, and a growing number of citizens in Massachusetts, understand that overharvesting is driving horseshoe crab populations everywhere dangerously close to functional extinction. It is incomprehensible to us why many state fisheries allow the harvest for bait of these animals that take 12 years to reproduce, and whose blood is crucial to human health and necessary to sustain migratory birds in their epic journeys from pole to pole.

The Ontario, Canada *Red Knot rufa subspecies recovery strategy* (2018), is clear about the cause of the Red Knot decline: “A primary threat to the subspecies lies with the management of the horseshoe crab fishery along the Atlantic seaboard of the United States. Overharvesting of horseshoe crabs has deprived migrating knots of an essential food resource required for birds to recover from long flights, to store nutrients, and to increase their body mass in preparation for further migration to the Arctic as well as to provide extra stores for survival after arrival on the breeding grounds (Morrison 2006; Morrison et al. 2007). Limited harvesting of horseshoe crabs should allow their recovery that may concurrently support the recovery of Red Knot numbers because survival of Red Knots has been linked to body masses at departure from Delaware Bay.”

The ASMFC must do more to help horseshoe crabs recover.

Recognizing the intrinsic value of horseshoe crabs, we are asking the Commission to:

- Restrict bait harvesting of horseshoe crabs in Delaware Bay (ARM Model Package 1) and extend the restriction to all states along the Atlantic coast.
- Continue the moratorium on the harvest of female horseshoe crabs in Delaware Bay and extend the moratorium to all states along the Atlantic coast.
- Continue the restrictions above until horseshoe crabs increase in number to levels seen prior to the 1990s crash and the population of red knot meets the 81,900-threshold set in 2013.
- Call for an end to the “Confidentiality” laws that preclude the public from access to data and information as to the numbers of horseshoe crabs that are captured, released, and/or die because of blood extraction by biomedical labs.
- Research and evaluate biomedically bled crabs’ mortality rates, egg reproduction and effects on spawning behavior.
- Track and report biomedical mortality using independent observers. Hold biomedical companies accountable for exceeding mortality limits.
- Establish an independent agency to regularly inspect biomedical labs and holding tanks, pens, and ponds.
- Institute regulations that make bleeding horseshoe crabs for biomedical uses a more sustainable practice by requiring humane treatment of horseshoe crabs before, during and after blood extraction and includes pre and post bleeding nutrient infusions prior to release.
- Support phasing out the use of horseshoe crab blood.
- Identify, quantify, monitor, and restore suitable spawning beaches and marsh habitat known to support juvenile horseshoe crabs in Delaware Bay. Extend the recovery program to all states along the Atlantic coast.
- Coordinate with the Ministry of the Environment, Conservation and Parks, Ontario, Canada to implement a strategy to restore horseshoe crab and red knot populations.

Again, with horseshoe crabs remaining at historically low numbers under the current regulations, we urge you to do more to protect these creatures and not make a bad situation worse by lifting the moratorium on harvesting female horseshoe crabs and allowing the harvesting horseshoe crabs for bait in Delaware Bay. And please extend the regulations to Massachusetts and all states along the Atlantic coast. Thank you for the opportunity to comment.

Sincerely,



Sharl Heller, President

Dear Atlantic States Marine Fisheries Commission (ASMFC),

The Safina Center is very concerned with the status of the horseshoe crab population in Delaware Bay and beyond. As such, we oppose the ASMFC's proposed addendum VIII in the Horseshoe Crab Fishery Management Plan to increase the horseshoe crab quota for the bait industry. We also oppose the potential lift of the ban on taking female horseshoe crabs in the region.

We are concerned that the data influencing the changes in the draft addendum has not been released to the public, making it impossible for concerned citizens and advocacy groups to properly inform themselves on the information at the base of this decision. With both horseshoe crabs and red knots at historically low numbers, now is not the time to increase the killing of horseshoe crabs in Delaware Bay, one of the last places where horseshoe crab numbers are high enough to attract migrating red knots in large numbers.

In the *2021 Revision to the Adaptive Resource Management Framework and Peer Review Report*, the reviewers write, "Because the changes would lead to harvest of female HSC [horseshoe crabs], which has been restricted since the implementation of the original ARM [adaptive resource management] Framework, **the Panel cautions the WG [working group] to fully consider if the new reward function truly represents the values articulated by stakeholders in the 2009 ARM Framework.**" We believe that the values of stakeholders do not support increasing the number of horseshoe crabs killed in the Delaware Bay Region. The ASMFC should listen to the Panel of reviewers and consider these values before increasing quotas.

Too often, managers fail to take action to protect a species until the species is so reduced it is on the brink of extinction. We urge the ASMFC not to make this mistake in the case of the horseshoe crab.

Sincerely,



Carl Safina, PhD
Founding President, The Safina Center
Endowed Professor for Nature and Humanity, Stony Brook University
Cell: 631 838 8368

Making A Case For Life On Earth



AMERICAN LITTORAL SOCIETY

18 Hartshorne Drive, Suite 1, Highlands, NJ 07732

Mr. J. Clarke, Chair
Horseshoe Crab Management Board
Atlantic States Marine Fisheries Commission

By Email

Mr. Clarke,

I am writing to express the deep concerns of the American Littoral Society regarding the possible action by ASMFC at its Summer Meeting of the Horseshoe Crab Management Board to substantially modify the policies and approaches to protecting the crabs and red knots of Delaware Bay through a highly-technical modification to the Adaptive Resource Model (ARM) utilized by the Commission, through the initiation of Addendum VIII.

The impact of the central parts of the revisions – to change the harvest restrictions and reopen the bait fishery’s access to female horseshoe crabs despite the lack of recovery to date of the red knot populations which depend on the eggs they produce – is buried under hundreds of pages of technical discussions. Leading members of the ASMFC’s own advisory committee have tried raise this concern to the primacy it deserves, and even the Peer Review Committee urged caution. Further, this fundamental change in policy and risk to the recovery of the red knot is being done behind the closed doors of the modeling committees without robust and engaged public consideration of the acceptability of the risk to important stakeholders including the broader public and conservation community. Requests by leading members of the conservation and environmental communities for access to the models have been denied.

Even the outside Peer Review Committee raised concerns about the shift in policy embedded in technical changes and the adequacy of how well public and stakeholder concerns were taken into account. I doubt that the public’s tolerance to the possibility of red knot extinction is as high as this new ASMFC direction envisions. In the Peer Review report, the experts advised:

“Because the changes would lead to harvest of female HSC, which has been restricted since the implementation of the original ARM Framework, the Panel cautions the [Working Group] to fully consider if the new reward function truly represents the values articulated by stakeholders in the 2009 ARM Framework.”

I strongly urge the Commission to not approve the proposed Framework Revision before you for consideration on August 3, 2022.

Under the current framework, no female crabs can be harvested in Delaware Bay for bait until the female population reaches 11.2 million crabs or the total red knot stopover population reaches 81,900 birds. Neither metric has yet been attained.

Under the proposed management revision, 175,000 to 190,000 females could be harvested as soon as 2023, according to some experts. In reaching this decision, the ASMFC disproportionately relied on surveys it has long considered biased and of dubious accuracy, which “reduces the scientific credibility” of the proposed revision, according to committee members and former proponents of the ARM framework (Niles, Burger, Mizrahi, & Dey, 2021).

The *only* horseshoe crab-specific survey thought historically reliable—the Virginia Tech trawl survey—continues to indicate that female horseshoe crabs are in trouble.

I would request that the Board hold the draft addendum until it can be amended to reinstate the original, stakeholder based protections regarding recovery levels prior to reopening female crab harvest, and that the fundamental modeling and other technical analyses foundational to the addendum's recommendations be publicly shared and fully made available and reviewed by interested stakeholders.

Thank you for your attention to these comments.

Sincerely,

Tim

Tim Dillingham, Executive Director

Los Angeles Audubon Society
P.O. Box 931057
Los Angeles, California 90093-1057



September 24, 2022

Via email (comments@asmfc.org)

Caitlin Starks
Atlantic States Marine Fisheries Commission
1050 N. Highland St. Suite 200A-N
Arlington, VA 22201

Re: Horseshoe Crab Draft Addendum VIII

Dear Ms. Starks:

Los Angeles Audubon Society has been a voice for birds and conservation in Los Angeles for over 100 years. Our mission is to promote the study and protection of birds, other wildlife, and their habitats throughout the diverse landscapes of the Los Angeles area. We have over 3,500 members and supporters, most of whom live in the City of Los Angeles, although we have some members in New York and elsewhere on the East Coast. The fate of the Atlantic horseshoe crab (*Limulus polyphemus*), and the intersecting plight of the *rufa* Red Knot (*Calidris canutus rufa*), is, however, of hemispheric importance and concerns all those who care about the exploitation of wildlife and the catastrophic loss of birds in the Americas.

From the data available, it appears that the overharvest of horseshoe crabs that occurred in the late 1990s created a population crash from which the species has not recovered. The *rufa* Red Knot population similarly crashed and has not recovered. We certainly understand and approve in concept of the adaptive resource management approach that has been taken to manage the horseshoe crab bait fishery. The underlying model, however, does not set the density of horseshoe crab eggs on shores of the Delaware Bay as a management goal, and this density still falls an order of magnitude lower than pre-crash conditions. When a program governed by adaptive resource management is not resulting in desired outcomes (population recovery) then it is time to revisit either the model or the values placed on different outcomes. Frankly, it seems that here too much value has been placed on maintaining the bait fishery.

The Commission seeks input on the level of rounding for the optimal harvest recommendation. Rounding is necessary because the level of take for the biomedical industry is, for some reason, confidential. We question the need for confidentiality on the level of take for a public resource. If, as some authors assert (Botton et al. 2022), take for medical purposes is dwarfed by the adverse impacts of other factors, there should be no reason to need to keep said numbers confidential. Furthermore, the numbers of crabs bled in the Delaware Bay have been published for 2001–2017 (Botton et al. 2022). If rounding is indeed necessary and the secrecy of private

corporations benefiting from exploitation of public resources outweighs the public's right to know the data upon which its agencies base their decisions, then the conservative approach of rounding to the nearest 50,000 should be taken.

The revised adaptive resource management process under consideration is a weakening of protections for horseshoe crabs and by extension for Red Knot. Neither population has recovered under the current management plan. This may arise in part from the long time to maturity for horseshoe crabs (11–12 years) and the high sensitivity to first-year survival (Sweka et al. 2007). But recovery is not assured, because the “ecological void” left by the crash of the horseshoe crab population may be filled by competitors that inhibit recovery (Hata and Hallerman 2022).

The Commission should act with caution and not loosen take restrictions prematurely. Neither species in the system is anywhere approaching pre-2000 numbers and the noise in the data suggesting even the start of a recovery is too great to draw any conclusion. For the birds, the key factor for recovery, horseshoe crab egg density on the shore, has not recovered and the *rufa* Red Knot remains imperiled. Birders and bird conservationists are watching the Commission's decision and hoping that instead of weakening protections, that stronger limitations on take of horseshoe crab are adopted.

Respectfully,



Travis Longcore, Ph.D.
President and Conservation Co-Chair

Literature Cited

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- Hata, D. N., and E. M. Hallerman. 2022. Relative abundance of horseshoe crabs in the Delaware Bay region: a critical factor for adaptive resource management. Pages 415–433 in J. T. Tanacredi, M. L. Botton, P. K. S. Shin, Y. Iwasaki, S. G. Cheung, K. Y. Kwan, and J. H. Mattei, editors. *International Horseshoe Crab Conservation and Research Efforts: 2007–2020*. Springer, Cham, Switzerland.
- Sweka, J. A., D. R. Smith, and M. J. Millard. 2007. An age-structured population model for horseshoe crabs in the Delaware Bay area to assess harvest and egg availability for shorebirds. *Estuaries and Coasts* **30**:277–286.



The Valley Forge Audubon Society joins NJ Audubon in opposing the Atlantic States Marine Fisheries Commission's (ASMFC) proposal to increase the harvest of horseshoe crabs, including a possible renewed harvest of females. Horseshoe crab eggs provide essential food for migrating federally-threatened Red Knots, whose numbers along Delaware Bay have plummeted from more than 90,000 in the 1990s to only 12,000 this year and an estimated all-time low of 6,800 in 2021. Increasing the harvest will have a significant negative impact on Red Knots and other shorebird species that depend on horseshoe crab eggs during spring migration stopovers in Delaware Bay, putting them at risk of further population declines.

We hope to enjoy visiting the Delaware Bay for many years to experience the Red Knot stopover on their amazing 9,000 mile migration from the southernmost tip of South America to their nesting area in the middle- and high-Arctic areas of northern Canada. Help ensure that these remarkable birds get all the horseshoe crab eggs they need to thrive and grow as a species for generations to come. Please do not increase the harvest of horseshoe crabs.

Sincerely,

A handwritten signature in black ink, appearing to read "V.A.S.", written over a light blue horizontal line.

Vincent Smith, President
Valley Forge Audubon Society

From: [Mark Nardone](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Thursday, September 8, 2022 4:38:57 PM
Attachments: [image001.png](#)

Delaware Nature Society (DNS) joins the National Wildlife Federation in opposing the Atlantic States Marine Fisheries Commission's (ASMFC) proposed Addendum VIII of the Interstate Horseshoe Crab Fishery Management Plan. We urge the commissioners to reject it as written.

Several indicators show both horseshoe crab populations and the population of a Federally threatened shorebird, the Red Knot, which depends on horseshoe crab eggs for their survival, are well below recovery thresholds. ASFMC's proposal could reduce the populations further.

The model Addendum VIII is based on has not been made public, so Delaware Nature Society and other concerned parties cannot be assured the proposed change would protect a healthy, sustainable population of horseshoe crabs. Even if the supporting data were to be shared today, there is not enough time to analyze it for accuracy before the public comment period ends on September 30.

Delaware Nature Society is also gravely concerned that ASMFC's plan would raise quotas on the killing of horseshoe crabs for use as bait by allowing for the harvest of female horseshoe crabs.

Under the current ASMFC framework, there is no female crab harvest until the female population reaches 11.2 million or until the Delaware Bay total Red Knot stopover population reaches 81,900. Neither the red knot nor female horseshoe crab populations of Delaware Bay are close to those numbers. We therefore believe female harvest would make recovery of the species virtually impossible.

Red Knot populations have also reached historic lows. In the 1990s, more than 90,000 a year could be found along Delaware Bay. The number was estimated at 6,800 in 2021—an all-time low. Though 12,000 were counted in 2022, the meager increase, given the dramatic population crash over time, does not inspire hope for species.

Shorebird populations have plummeted more than 70 percent over the past 50 years. That decline is the world's number one conservation crisis facing birds. Permitting harvest of female horseshoe crabs at this critical moment virtually ensures the population of shorebirds such as the Red Knot will never recover.

We therefore respectfully urge the commissioners to reject proposed Addendum VIII of the Interstate Horseshoe Crab Fishery Management Plan.

Thank you,

Mark Nardone

Director of Advocacy, Delaware Nature Society
Mark.Nardone@DelNature.org | 302.500.2559 M



Together we envision a healthy and sustainable environment.

From: [Jim Myers](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Wednesday, September 21, 2022 4:08:14 PM

To whom it may concern:

Washington Crossing Audubon Society (WCAS) is opposed to the Atlantic States Marine Fisheries Commission's (ASMFC) proposal to increase the harvest of horseshoe crabs used for bait. This action could allow the harvesting of female horseshoe crabs to resume, threatening the Red Knot that relies on the horseshoe crab eggs during its migration stop along the Delaware Bay.

The Red Knot migrates from southern Argentina to the Arctic Circle. The Delaware Bay migratory stop is essential for putting on enough weight to complete the journey. Horseshoe crab eggs are the vital source of food for the migrating birds. Female horseshoe crab harvest was stopped because egg density studies showed that there were not enough eggs to sustain the Red Knots and other shorebirds during the migratory stop at the Delaware Bay. The egg density continues to be too low to sustain the migrants.

Under the current management plan, female horseshoe crab harvest is not permitted until female crab numbers reach 11.2 million crabs or the Red Knot stopover population reaches 81,900 birds. There is no data indicating that these numbers have been reached. On the contrary, only 12,000 Red Knots were counted along the Delaware Bay in 2022. The numbers clearly show the population has not recovered to a healthy level that would allow the harvesting of its primary food source.

WCAS urges the ASMFC to reject the proposed change in the horseshoe crab harvest. Such a change is not scientifically justifiable and could lead to devastating declines in Red Knot populations, a species already under serious survival pressures.

Sincerely,

Jim Myers
President
Washington Crossing Audubon Society
<https://www.washingtoncrossingaudubon.org/>

This letter was submitted by 25,948 individuals.

From: _____
To: _____
Subject: _____
Date: _____

Dear Senior Fishery Management Plan Coordinator Caitlin Starks,

I am writing to urge ASMFC to protect red knots by rejecting Addendum VIII to the fishery management plan for horseshoe crabs.

Delaware Bay is a linchpin for one of the most epic migrations on Earth. Every year, red knots fly from as far south as Tierra del Fuego to their breeding grounds in the Arctic Circle. They reach Delaware Bay just as horseshoe crabs emerge from the water to lay eggs upon the beach. These eggs provide crucial nourishment for red knots to complete their journey and breed successfully.

In recent decades, overfishing has decimated the horseshoe crab population at Delaware Bay, leading to a sharp decrease in red knots, which are now listed as “threatened” under the Endangered Species Act. Under the current management program, horseshoe crabs have not recovered, and red knots have continued to decline. Rather than taking steps to reverse this trend, Addendum VIII would open the door to resuming the harvest of female horseshoe crabs, further imperiling red knots and potentially violating the Endangered Species Act.

Red knots face an uncertain future and require a precautionary management approach. ASMFC should reject Addendum VIII, which would put red knots at even greater risk.

Sincerely,
XXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXX

This letter was submitted by 4,010 individuals.

From: _____
To: _____
Subject: [External] Oppose Amendment VIII to the Horseshoe Crab Management Plan
Date: Thursday, September 22, 2022 1:20:27 PM

The Atlantic States Marine Fisheries Commission should reject any proposed management of horseshoe crabs that would lead to the increase in harvest of horseshoe crabs, particularly if that increase includes the harvest of female horseshoe crabs.

Under the existing management framework, the commission has said that it would not allow harvest of female horseshoe crabs unless the crab population was 11.2 million crabs or the threatened rufa red knot stopover population reached 81,900 birds. Neither threshold has been met, and yet the commission is insisting on changing the population modeling that would allow a harvest increase, including the first harvest of female horseshoe crabs in decades.

With red knot counts of 12,000 birds this year, up from only 6,800 last year, it defies common sense that horseshoe crab harvest should be increased. More worrisome is that the public has yet to see the full details of the scientific model that justifies this harvest increase.

I urge the commission to abandon Amendment VIII to the Horseshoe Crab Management Plan, share the full scientific details of the model with the public, and include other scientific data sources such as horseshoe crab egg density and red knot aerial surveys into the model before recommending any changes to harvest.

Thank you,
XXXXXXXX

This letter was submitted by 15 individuals.

From: _____
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII Tuesday,
Date: September 27, 2022 9:42:14 AM

Dear Ms. Starks:

I strongly oppose adopting the 2021 ARM Framework revisions under Draft Addendum VIII as a standard for setting horseshoe crab bait harvest specifications. The value of migratory birds and the need to manage these resources across jurisdictions has been recognized in the United States for more than a hundred years. I am very concerned that adopting the changes proposed in the 2021 ARM Framework revision will not only setback decades of conservation efforts to protect migrating shorebirds, but, that this change could also cause irreparable damage to shorebird and horseshoe crab populations.

The underlying data supporting the new draft addendum to the plan has still not been released to the public, so conservation groups and concerned citizens have no way to understand the science on which the new proposal is based. When will the data supporting this plan be released?

Making matters worse, ASMFC also does not include the most recent field survey data for red knots, which suggest historically low numbers of red knot feeding through the spring season in Delaware Bay. In the 1990s, more than 90,000 could be found along Delaware Bay during aerial surveys. This year, only 12,000 were counted, and in 2021, the number was estimated at an all-time low of 6,800. This doesn't necessarily mean the population has crashed, but could indicate that red knots are bypassing the Delaware Bay stopover altogether in search of life-sustaining food sources elsewhere. This makes their migratory journey all the more perilous, which could further impact the population recovery. Given this uncertainty in the status of red knot in Delaware Bay, extreme caution should be taken in making any management decisions that could negatively affect them.

Horseshoe crabs are a vital part of their ecosystem . There is much that we still need to learn about their role in their world and in our world. The conservation of our shorebirds, such as Redknots,also needs to be a priority. We are losing our bird populations at an alarming rate and we need to protect them now and into the future for our children and grandchildren.

I strongly oppose the use of the 2021 ARM Framework as the basis for setting horseshoe crab harvest regulations. I urge the ASMFC to make no change to the regulations.

Sincerely,

XXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXX

This letter was submitted by 289 individuals.

From: _____
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Tuesday, August 30, 2022 3:40:09 PM

Dear ASMFC,

As a resident of the Delaware River and Bay and an active volunteer monitor who has helped assess and count horseshoe crabs over the years during crab spawning surveys, I urge the Atlantic States Marine Fisheries Commission (ASMFC) to not backtrack and allow for the killing of female horseshoe crabs for fishing bait. I urge the ASMFC to keep protections in place and if anything, to strengthen protections - as the situation is dire in our beloved Delaware Bay for the shorebirds and the horseshoe crabs. Please abandon any attempts to weaken the current moratorium on horseshoe crab harvest.

- The threats to these animals are graver than ever. Now is not the time to weaken protections for these imperiled species and the critical ecosystem role the horseshoe crab provides for the Delaware Bay.
- Based on field work, including egg density studies conducted by the Delaware Bay Shorebird Project and other organizations, we do not believe that horseshoe crab populations are recovering from their population crash in the 1990s. Egg density data is the most reliable indicator of the horseshoe crab population, and importantly, it is the most reliable index of value for red knots and other shorebirds. Yet ASMFC has never included these surveys in its modeling. Making matters worse, ASMFC also does not include field survey data for Red Knots, and these show that Red Knot populations are at historic lows. In the 1990s, more than 90,000 could be found along Delaware Bay. This year, only 12,000 were counted, and in 2021, the number was estimated at an all-time low of 6,800. Evidence is now emerging that Red Knots are bypassing the Delaware Bay stopover altogether in search of life-sustaining food sources elsewhere. This makes their migratory journey all the more perilous.
- The Cornell Lab of Ornithology says that shorebirds like the red knot are plummeting toward catastrophe, with their declines representing the world's number one conservation crisis facing birds today. And the killing of female horseshoe crabs all but assures that their population levels will never rebound.
- The joint collapse of red knots and horseshoe crabs is not inevitable. But your proposal propels them closer to that grim reality.
- The Ecotourism dollars the Delaware Bay receives because of the crabs and shorebirds that flock there cannot be undermined by short term fishery interests and lack of the precautionary principle by the ASMFC.
- The ASMFC must provide the raw data, modelling and analysis which justifies the expansion of the harvest of female horseshoe crabs for the public to thoroughly review before any action can be taken.
- I remain concerned that the underlying data supporting the new draft addendum to the plan has still not been released to the public, so that conservation groups and concerned citizens have no way to truly understand the science on which the new proposal is based.
- There is no way to meaningfully comment on a proposal when you are not releasing the data supporting the types of increases you propose. With both red knots and horseshoe crabs at historically low numbers, we cannot take your assertions on faith.
- Under the current framework there is no female crab harvest until female abundance reaches 11.2 million crabs or until the Delaware Bay total red knot stopover population reaches 81,900

birds. The proposed revision would allow the resumption of the female harvest, even though neither the red knot nor female horseshoe crabs of Delaware Bay are close to satisfying either metric.

- The ASMFC should ensure that the original safeguards in their harvest policies prohibiting female horseshoe crabs from being harvested until red knot numbers recover are included in any new policies.

I request that any future public meetings on the horseshoe crab harvest I be notified directly so I may be able to better defend the crabs from the very agency that should be protecting this species in the first place.

Thank you for your time and consideration.

Sincerely,

XXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXX

This letter was submitted by 674 individuals.

From: _____
To: [Comments](#)
Subject: [External] Subject line: Horseshoe Crab Draft Addendum VIII.
Date: Sunday, September 11, 2022 11:03:46 AM

I join NJ Audubon in opposing the Atlantic States Marine Fisheries Commission's (ASMFC) proposal to increase the harvest of horseshoe crabs, including a harvest of females for the first time in over a decade. This action will have a significant impact on the federally threatened Red Knot and other shorebirds that depend on horseshoe crab eggs during spring migration stopovers in Delaware Bay, putting them at risk of further population declines.

Thank you!

XXXXXXXXXXXXXXXXXX

XXXXXXXXXXXX

This letter was submitted by 2,987 individuals.

From: _____
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Friday, September 16, 2022 10:32:02 AM

Greetings,

I am writing to encourage the Atlantic States Marine Fisheries Commission to reject draft Addendum VIII to the fishery management plan for horseshoe crabs. With the threatened red knot inching closer to extinction, the species cannot afford further regulatory concessions.

Red knots rely on horseshoe crab eggs for fuel during their global migration. They time their trip to coincide with the crab's annual spawn, in one of the East Coast's most cherished wildlife spectacles. During a brief pitstop, each knot must consume roughly 400,000 nutrient-rich eggs before departing for the Arctic. So great are the stakes, the birds that fail to acquire such reserves are less likely to survive and reproduce.

In Delaware Bay, horseshoe crabs have failed to recover from decades of severe overharvesting. Red knots also remain at historic lows. Despite these obvious trends, Addendum VIII would allow the resumption of killing of female crabs at a time when emergency measures are needed.

Under the current framework, no female crabs can be harvested in Delaware Bay for bait until the female population reaches 11.2 million crabs or the total red knot stopover population reaches 81,900 birds. Neither metric has yet been attained.

I encourage the ASMFC to not only reject Addendum VIII but to recommit to true recovery measures, in accordance with the Endangered Species Act.

Thank you,
XXXXXXXXXX

This letter was submitted by 5 individuals.

From: _____
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Wednesday, September 28, 2022 6:59:38 PM

To whom it may concern,

I join CU Maurice River and the South Jersey Bayshore Coalition in opposing the Atlantic States Marine Fisheries Commission's (ASMFC) proposal to reverse the current framework for horseshoe crab management. This proposal contradicts ASMFC's established regulatory precedents, fails to consider relevant data, and ignores the will of local stakeholders.

If the ASMFC increases the allowable harvest of horseshoe crabs and lifts the longstanding moratorium on the harvesting of females, Bayshore ecology will be weakened and local economies negatively impacted. For these reasons, I urge the ASMFC to retain the established management framework, maintain the current limits on horseshoe crab harvesting, and continue the moratorium on harvesting female horseshoe crabs.

Sincerely,
XXXXXXXXXXXX

This petition recieved 412 signatures.

We, the undersigned, believe the horseshoe crab population and the shorebird population, which feeds on the horseshoe crab eggs, should be protected. Therefore, we strongly urge the Atlantic States Marine Fisheries Commission to OPPOSE Horseshoe Crab Addendum VIII, which would remove these protections.

	NAME	ADDRESS
1	Ellen Meyer	2 Logworth Ct. Cedar Run NJ 08092
2	Sarah Fabiano	59A Bayview Dr Long Beach Township, NJ 08008
3	Olivia Smith	172 Concord Ave Hamilton NJ 08614
4	LISA Bonavita	102 W. New Jersey Ave, Long Beach Township, NJ 08008
5	Rebecca Dondero	1 Jonathan Dr., BHW 08050
6	Maryanne	75 Culfax Rd Springfield 07097
7	Joe Langley	4350 Lehigh Dr. Walnutport PA 18088
8	Deon Goddard	6 Colony Ct. Woodloch NJ 08085
9	Nicole Goddard	510 Montana Dr. Lincoln University 19352
10	Coit Nitschmann	4 Independence Dr. Burdettown NJ
11	Cindy Nitschmann	4 Independence Dr. Burdettown, NJ
12	Alli Daly	15 Village Dr. W Yardville, NJ
13	Nicole Gerdes	1 Erin Ct Robbinsville NJ 08691
14	Karen Byrnes	428 Engleside Ave Beach Haven NJ 08008
15	Diane Zoravian	17 Linda Dr., Allendale NJ 07401
16	Janice Nilson	906 Oceanfront Ship Bottom, NJ
17	Jill Stier	1400 South Ave #403 Plainfield NJ 07062
18	Christine Gardner	148 Miller Rd. Kenilworth NJ 07033
19	Liz + Tom Goldy	406 Thomas Ave Lyndhurst NJ 07071
20	Roselle Tazza	Wyc Koff. NJ. 07481
21	Susana Perez	5036 245th St Douglaston NY 11362
22	Alison Sapers	1 S. Lincoln Ave, Newtown, PA 18940
23	Chris Mistry	100 West 16th St. Beach Haven NJ 08008

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	NAME	ADDRESS
24	Deb Cummins	20 Macintosh Rd Brambling NJ 08876
25	Amy Pinto	31 Meal Lane, Brant Beach, NJ
26	Lynn Falcone	126 Chatsworth Avenue, Beach Haven, NJ
27	Lisa Damore	3 Fallow Way, Monroe Twp, NJ 08831
28	Alexa Aquino	34 W sailboat Lane, Long Beach Township
29	Sarah Sobor	48 Miriam Drive Warwick NY 10990
30	Tracy	23 E 30th Street Beach Haven Gardens
31	Angelica	125 Engleside Ave Beach Haven NJ
32	Jr	271 Wills Ave RE NJ 07661
33	Susan Pajunas	98 Charlestown Rd. Hampton, NJ 08827
34	Jackie Forsberg	1355 Paul Blvd., Manahawkin, NJ 08050
35	ESTHER O'Donnell	68 Norris Ave, Metuchen, NJ 08840
36	PEGGY McGovern	9 COLUMBIA AVE, LONG BRANCH, NJ 07740
37	Donna Euliett	219 Dolphin Ave Beach Haven
38	April Michal	11 Mary Alice Rd Manahawkin NJ 08050
39	CORINE Chiarello	7 Mary Alice Rd Manahawkin NJ 08050
40	Pamela Fertitta	419 Engleside Ave Beach Haven NJ 08008
41	Noren Labenne	328 Essex Ave BH NJ 08008
42	Margaret Cambridge	891 Jennifer Lane Manahawkin NJ 08050
43	KARIN STROUD	166 SCHLUETER DR. HOPEWELL JCT. NY 12533
44	M. Heiber	23 Beach Haven Way, Waretown 08758
45	Aue Saecario	303 Sunflower Dr. EHI, N.J. 08234
46	Rob Longley	4350 Lehigh Dr. Walnutport PA. 18088

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	NAME	ADDRESS
47	George Premezari	26 Hazecwood Terrace, Tinton Falls NJ 07924
48	Bradley	2545 Cortez Ln Rd Rockville MD
49	Grace Amodeo	824 E Grand Ave, #2, El Segundo CA 90245
50	Cristin LaMere	17W Cape Cod LBI
51	Remmus Wirth	12 Monarie Rd. Monnus Plains NJ 07910
52	Lori Pacansky	1600 Long Beach Blvd LBT NJ 08008
53	Jay Bowman	1703 Beach Ave N. Beach Haven
54	Elissa Kurland	14 Sunnyside Place Irvington, NY 10533
55	Shannon P. Kujala	170 Prospect Ave Apt 16J Hackensack, NY 07601
56	Reanna Ventresca	3200 1600 Rockcross Dr Jamison Pa 18929
57	Robert Salvo	1676 Rockcross Dr, Jamison, PA 18929
58	Grain Ventresca	6095 W mill road Flourtown PA 19031
59	Mary Gravata	39 Cooper Rd Oak Ridge NJ 07438
60	Lynn Nielsen	172 Southard Dr. 7 Kavaland NJ
61	Marcain Burrowsky	37 Bradley Lane, Bridgewater NJ 08807
62	Kayla Foley	105 E 21 st St Beach Haven NJ 08008
63	Carol Negresky	281 Hazlett Way Somersat NJ 08873
64	Jesse Kleinman	14 westgate Rd Livingston NJ 07039
65	Trisha Ogden	25 meadow Ave Unit 52 Mammouth Beach NJ 07750
66	Marian Redmond	900 N. Beach Ave. #19 Beach Haven N.J.
67	Evi E Wildonger	100 West 16 th St. Beach Haven NJ.
68	Anne Pereira	39 Limoli Ln Clark NJ 07066
69	Joe Pereira	39 Limoli Lane Clark NJ 07066

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	NAME	ADDRESS
70	Dorothy Meehan	5401 West Ave. Hockate N.J. 08008
71	DENNIS J. MEEHAN	5401 WEST AVE HOCKATE N.J. 08008
72	Shay Connolly	30 ELEVENTH ST., BEACH HAVEN, NJ
73	ADRIANA DIAZ	101 JEREMY LN. MANAHAWKIN NJ 08050
74	Nick D'Aprix	155 Roseland ave, Caldwell, NJ 07006
75	Meg Quinlisk	807 S. Beach Ave. Beach Haven 08008
76	Joe Hoffman	5 Congress Court Somerset, NJ 08873
77	KARA HETZ	2225 MUMFORD ST., PHILADELPHIA 19125
78	Deanne Melloy	2750 Marion Way Doylestown PA 18902
79	Carol Snow	4 East 17th Street, LST 08008
80	Kelly Minard	240 Prospect St Apt 1 Cambridge, MA 02139
81	Katherine Lilley	1105B Long Beach Blvd North Beach, NJ 08008
82	Bailey Schilling	2 Teakwood drive, Little Egg Harbor, NJ 08008
83	DENISE GROZE	1052 MAPLE AVE., REEBLING, NJ 08554
84	Maya Vasquez	476 PULASKI ST, BROOKLYN, NY 11221
85	F Zzy Snow	191 Claremont Ave Apt 34 10627
86	Brittany Drigan	435 Amber Street. Beach Haven, NJ
87	Mary E. Ka	78 Foxcroft Rd Doylestown Pa
88	Christine Summers	6147 Mulberry Ct. Pipersville, PA 18947
89	Lauren Schmalz	833 Lombard St. Philadelphia, PA, 19147
90	Lara Good	150 east 87th St 5C New York New York 10128
91	Jim S...	1208 Sea Girt Ave., Sea Girt, NJ 08750
92	MARISA LUMINO	5031 EDWIN AVE #1A FORT LEE NJ 07024

We, the undersigned, believe the horseshoe crab population and the shorebird population, which feeds on the horseshoe crab eggs, should be protected. Therefore, we strongly urge the Atlantic States Marine Fisheries Commission to OPPOSE Horseshoe Crab Addendum VIII, which would remove these protections.

	NAME	ADDRESS
93	Loree Reepel	50 Campbell St. Waldwick NJ 07463
94	Sarah Reepel	50 Campbell St. Waldwick NJ 07463
95	Tina Lumino	11 Jackson Ave #56 Scarsdale NY 10583
96	Dana Jeffas	55 Manitoba Trl Shamong NJ 08088
97	Nina Primas	1 Knoll Ct Stratford NJ 08084
98	Jayne Guarino	1405 Durham Ave South Plainfield NJ 07080
99	Rebecka Guarino	1405 Durham Ave. South Plainfield, NJ 07080
100	Wendy Cikat	109 Inboard Ave Manahawkin NJ 08050
101	Jimattiello-Ferrara	49 Portsmouth Ln, Tuckerton, NJ 08087
102	Jayne Kaldman	133 Four Winds Dr. Middletown, NJ 07748
103	Blaine Galatin	59 Pine Hill Circle Pylesstown PA 18901
104	Phyllis Meber	500 Liberty Ave, Beach Haven 08008
105	Sarah Magni	1221 Brookfield Lane Waterford NJ 08089
106	Lizzie Magnoni	1221 Brookfield Lane Waterford NJ 08089
107	DE MacFarland	254 Willow St. Macungie, PA 18062
108	[Signature]	522 N. Maple Ave Pyleswood NJ 07450
109	Ginny Williams	429 Oceanfront, Ship Bottom, NJ
110	Laura Koshel	921 Bermuda Dr., Branchburg, NJ 08853
111	Pam Horstmann	764 Benge Rd Hockessin, De 19707
112	SARAH MCGINTY	5560 W LOCUST ST OXFORD PA 19363
113	Karen Jackowski	60 Belton St. Stanhope NJ 07874
114	Cathy Colangelo	670 Wallace Way Weatherly PA 18255
115	Emma Horn	5067 High Terrace Rd. Stroudsburg, PA 18360


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	NAME	ADDRESS
116	J Westvile	10 Inlet Rd Hb/gate NJ
117	Daniel Fuhe	1902 Meadow Ln. Wyomissing, PA 19610
118	Jessica Minora	227 Page Ave Lyndhurst NJ, 07021
119	teresa Minora	" " " "
120	Donna Lyon	203 Valleyview Rd, Riegelsville, PA 18077
121	Barbara James	1695 Rockcross Dr Jamison Pa. 18929
122	Rose Decket	2 Applegate Dr., Florence, NJ 08518
123	LISA Ulmer	277 St David Ct Mt Laurel NJ 08054
124	Madison Smith	8 Francis Lane Monice NY 10950
125	Michelle Rodge	196 Marienstein Rd UBE PA 18972
126	Chantal Reffler	3 Englec St. Green Brook NJ 08812
127	LISA Jones	128 Killarney Dr, Burlington VT 05408
128	Michele McGuire	3244 Country Lane, Bethlehem PA 18017
129	Elizabeth Miller	3009 Beth Pl. Nazareth, Pa. 18104
130	Mickie Disston	8831 Montgomery Ave Wyndmoor PA 19038
131	Cathy Polizzi	1 Inlet Rd. Long Beach Twp NJ
132	Linda Mosco	17 Royce Ct Mayetta NJ
133	Barbara Keller	118 E. Maryland Ave Beach Haven Terr.
134	Swilder	135 W Maryland Ave " " "
135	KIM THOMAS	107 GREENWOOD AVE, HASKELL NJ 07420
136	Paula Haughey	3127 Marshall Dr Melbourne, FL
137	P. Haughey	3127 MARSHALL DRIVE MELBOURNE, FL 32901
138	Marilyn B. Mangel	11 Allen Circle Boxford MA 01921

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	NAME	ADDRESS
139	KATHY ACCASTON	38 BAYDEARY DR. SOMERSET NJ 08873
140	BARBARA FERRICONE	64 FALLEN TIMBERS TR., Rockaway, NJ. 07866
141	Carly Narvise	2716 NEFLANDS Street Oregon 97232
142	Mary Traynor	10513 School St, Fairfax Va 22030
143	Eric Euns	3679 Nottingham Way Suite A Hamilton NJ 08690
144	Susan Scungarello	P.O. Box 172, Barnegat Light, NJ. 08006
145	Kathryn Fouquet	225 Woodlands Dr. Tuxedo Park NY 10987
146	B. Pisano	162 Sunny Dr New Rochelle, NY 10804
147	S. Willett	3616 Jonna Ct, Monrovia, MD 21103 21770
148	Kate McNeer	90 Seneca Road Belleville PA 17004
149	John Li-nigaw	08033 / 08057
150	Karli Griggs	42 Haddock dr. Sewell, NJ 08030
151	Maggie Aftanis	110 Berkeley Ave Beach Haven NJ 08008
152	Theresa Cardella	2 E 27th St Long Beach township, NJ, 08008
153	Carol Lukars	2014 Beach Ave, LBI, NJ 08008
154	Kristin Lopresti	u " u
155	Lynne North	6 Blinnet Ln Marlborough NJ 08050
156	Joann Polashock	1310 Woodgreen Lane Hainesport NJ 08036
157	Dorcas Ciborski	8389 Riverdale Ln Overport, FL 33896
158	ERIN Ciborski	11 Washington Place East White Plains NY 10603
159	Drew Perez	1569 Pine Wind Dr. 18011
160	Kevin Cavanagh	2 Harding Road. Glen Rock, NJ 07452
161	Kristin Cavanagh	2501 Beach Ave Spray Beach, NJ 08008

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	NAME	ADDRESS
162	Jimmy Donnelly	207B Shuster Ave Seaside Heights, NJ 08751
163	Kathryn Nicusamy	707 10th Ave Belmar NJ 08774
164	Patricia Gage	46 Elfman Dr. Doylestown, PA 18901
165	Joan Gautreau	9025 S.W. Sawgrass Way, Palm City, FL 34990
166	Diana IVANOV	45 Nancy Lane Barnegat NJ 08050
167	Sue Lucier	1051 Theodore Rd - Schick NY 12303
168	Danna Lopez	585 Trinity Place, P, Westfield, NJ 07090
169	Amy Carter	2204 Salt Wind Way Mt Pleasant SC 29466
170	Beth Tenney	485 Stoneglen St. Colleyville, PA 19426
171	YOLANDA WYTHE	1035 STEPHAN DR. BLUE BELT, PA 19422
172	Mollie Stone	21 Ship Channel Rd, South Portland, ME 04106
173	Donna Hoder	254 Evergreen Dr. Bay Head, NJ 08742
174	NANCY KAERICHER	108 Shell Bark Dr Milford PA 18337
175	ELVA ZINGARO	611 5TH STREET MILFORD PA 18337
176	Sandra Kupp	115 Kapp Dr Cowansville PA 16218
177	Mary Shannon	318 Conerty Rd Chicora, Pa 16025
178	LINDA KAPLAN	8 LEeward Passage, Hilton Head, SC 29928
179	Rosemary Leone	18 Snowden Lane Princeton NJ 08540
180	CAROL McPhillips	8 PORTOFINO DR. ROBBINSVILLE, NJ 08869
181	Noel Burch	400 Fairview Avenue Beach Haven 08008
182	Pamela Wren	40 Fairwood Blvd Pleasant Ridge MI 48069
183	Gianna Bonavita	2966 Foxhall Rd Charleston SC. 29414
184		308 Leeward Ave Mt - OXUP

We, the undersigned, believe the horseshoe crab population and the shorebird population, which feeds on the horseshoe crab eggs, should be protected. Therefore, we strongly urge the Atlantic States Marine Fisheries Commission to **OPPOSE** Horseshoe Crab Addendum VIII, which would remove these protections.

	NAME	ADDRESS
185	Lester Daly	107 East 7th St Freehold, N. J. 07728
186	Laura Casey	11411 Potomac Rd, Lorton VA 22079
187	Robin Curia	319 Stamefs Rd - Milford NJ 08048
188	Emily Gruner	604 5th Ave Belmar, NJ 07719
189	Kathy Kierce	356 Fiddlers Point Dr St Augustine FL 32080
190	Ed Bennett	1605 Partridge St. Toms River, NJ 08253
191	St. J.	11306 Beach Ave Aspen Beach
192	Jeanne Parker	517 Adams St, Pittsburgh, PA 15237
193	Jeff Warr	48 Rossmore Pl Bellville NJ 07109
194	Deborah Jimenez	64 Shore Ave Monahawke NJ 08050
195	Court Challegu	124 Marine St. Beach Haven, NJ 08008
196	Elmbergson	123 Coral St, Beach Haven NJ 08008
197	Susan Sheppard	112 W. Ship Bottom Ave. Ship Bottom, NJ 08008
198	Sonny Adoni	8 Beatrice St Beach Haven
199	Carrie Hunley	183 Saddle Drive Furlong, PA 18925
200	Jane von Oehsen	455 Cherry Valley Rd, Princeton, NJ 08540
201	Wendy Reichard	18 Jami Beth Dr. Mertztown PA 19539
202	Helen Goodwin	339 Windsor Dr. Cherry Hill NJ 08002
203	Cheri Lane	18 Cardinal Ct Kendall Park NJ 08824
204	Susan Belgaur	371 Elm Ave Bogota, NJ 07603
205	Gene Kew	52 onetard St, Pleasantville NJ 10570
206	Lee DeStefano	216 Fairview Ave Beach Haven
207	Olson Chuffe	6 W Susan Ave, Holgate, NJ 08008

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	NAME	ADDRESS
208	Asney Elmer	17 4th Ave Bluffton, SC 29910
209	Carolyn Elmer	1470 Paul Blvd, Manahawkin NJ 08050
210	Lauri J. Jolly	840 Ivy Rd Ambler PA 19002
211	Jama Eberg	9507 Wheelump Ln Phila PA 19118
212	TARA SUTPHEN	12 Laga Ct., Ringoes, NJ 08551
213	Staven	489 Clinton Ave Toms River NJ 08753
214	Ruthenberg	741 Drum Point Rd Breck
215	Linda P. Winkler	607 Nelson Rd, Johnson City NY 13790
216	Eden Cherny	113 Hadleys Mill Kennett Square PA 19348
217	Christine Lore	4312 Abitare Blvd, Voorhees, NJ 08433
218	Gianna Bonta	10 Plymouth Ct. 114 Hilly NJ 08060
219	CAROL CZARNECKI	82 Winsor Place, Rear Cottage, Glen Ridge, NJ 07028
220	Mam Huff	137 Woodland Ave Glensville NY 12078
221	Allyson G. Geyer	31 Seneca St. Troy, NY 12189
222	Whitl. Chasen	2826 Runata Pl Lewisport, NJ 08648
223	Junkin G. Gurr	2826 Princeton Pike Laurencive NJ
224	John	20A Kirschbaumweg, Bottmingen, Switzerland 4103
225	Marilyn	428 School Str., Mansdale PA 19525
226	Barb Garfield	14 Ramshorn Rd Milford NJ 08848
227	Mary Nieman	15 Marvin St Dover, NJ 07801
228	Susanne Kesper	40 Deal Lane, Waretown, NJ 08258
229	Cindy Wittweft	10 E Sand Drive Ln. L.B. Twp nj 08008
230	Dawn Ken	11 Pine trail medford NJ 08055

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	NAME	ADDRESS
231	Cal W. Snow	CANTONMENT, N.Y. 12515
232	Naomi Strauss	NYC 10025
233	ANDREA LEVINE	GALLOWAY, N.J. 08205
234	Linda Chadwick	Galloway, NJ 08205
235	PAT TROCANO	JUPITER FL 33477
236	Cynthia Kipple	Jupiter, FL 33477
237	Judi Kruscavage	Yardley, PA 19067
238	Jessica Kruscavage	Philadelphia, PA 19118
239	R. Cipollini Jr	10 Orange Hill Ln Columbus NJ 08022
240	KATE Commarato	55 Wetherli Rd Lane Valley NJ 07853
241	Marisa Rosveck	1745 Park ave, Washington, Pa 15301
242	Tracy Sommers	Hendersonville, NC
243	Aleson Geller	116 W. 17th St. Beach Haven, NJ
244	Debbi Kumpf	SILVER SPRING, MARYLAND
245	Andy Biennan	WESTFIELD, NJ
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	NAME	ADDRESS
1	Linda Kelly	13209 Beach Ave, LBT, NJ 08008
2	Fita R. DiAntonio	1109 Childs Ave; Strpl Hill, PA 19026 (314 Essex) B.H.
3	Amy Robinson	1650 Monte Vista Reno, Nevada 89511
4	Penelope Reardon	3371 Forest View La Brea Nevada 89511
5	Pinky NILSEN	2027 ^{P.O. Box} Long Beach Township, NJ. 08008
6	Cheryl Schrader	19 Joshua Dr. Mahanawken NJ 08050
7	Kathy Thomas	151 Chelsea Rd, White Plains, NY 10603
8	Melissa Perlestein	111 Clive Street, Edison, NJ 08820
9	Anne Hodson	40 Weston Ave Chatham, NJ 07928
10	Courtney Durham	11 W. McKinley Ave. LB. Township 08008
11	Steve Eisender	12915 Pacific Ave Ave BHT
12	Danielle Adams	1303rd Street Centre Hall, PA 16828
13	Carly Shanken	18 Judith Ave, Beach Haven
14	Lori Dougherty	5 E Texas Ave Long Beach Township.
15	Karen Jensen	Larimer Ave, Dept High PA
16	Trini Morahan	Quincy 20 Shuly Ln. L.B.L.
17	Ava Guardino	136 W end ave pompton plains NJ 07444
18	Ali Guardino	136 W end ave pompton plains NJ 07444
19	Denise Andrew	Roelofs Rd Yardcy. PA
20	Brenda Criff	in 2005 S. Beach B.H.
21	CSJL	1400 West Ave B.H.
22	Kate Quintile	807 S Beach Ave, Beach Haven, NJ
23	Sim Mally	40 West Park Place #39, Monistown, NJ 07960

Thank you! ♥

We, the undersigned, believe the horseshoe crab population and the shorebird population, which feeds on the horseshoe crab eggs, should be protected. Therefore, we strongly urge the Atlantic States Marine Fisheries Commission to OPPOSE Horseshoe Crab Addendum VIII, which would remove these protections.

	NAME	ADDRESS
24	Danielle Malloy	40 WEST PARK PLACE #309, MORRISTOWN NJ
25	Dana Richt	925 Minisink Way WESTFIELD NJ 07090 07960
26	Cemille Kaye	8822 Greenslope Dr. Unit A 78759, ATX
27	Scott Hutchinson	8322 greenslope Dr. Unit A Austin TX 78759
28	Emma Residenio	1178 Beach Lane, Monmouth NJ 08050
29	Kim Peoples	5 Wine St. Chatsworth, NJ 08019
30	Karen Distef	101 Cedar Ln Barnegat NJ 08005
31	Cathleen Sims	102 W. Roosevelt Avenue #3 Holgate 08008
32	Rebecca Josephson	407 Coral St. - Unit A, Beach Haven, NJ 08008
33	Sarah Clark	4 Garden Place Cranford, NJ 07016
34	Cinn Barry	39 Garden Path Barnegat NJ 08005
35	Yumara Hernandez	233 2nd. St. 2nd Fl Beach Haven, NJ 08008
30	Pat Walls	Mt Laurel NJ 08054
37	Lithy N'Dony	10 William St. North Beach
38	Anson Lyonel	2005 S Bay Ave, Beach Haven, NJ 08008
39	Ryanato	154 N. Lovett Ave L.S. NJ
40	Cyflera	20 Core Rd MORRISTOWN NJ 08057
41	Joseph Cavanaugh	40 Greenwood Ave Madison NJ 07940
42	Deis Kosiba	2 W. Jessy - Holgate n.j.
43	Jackie Wolf	26 e. Kansas ave - BHP
44	Elizabeth Wolf	210 e. Kansas ave - BHP
45	Omer Noam	26 e. Kansas ave - BHP
46	Barbara Higdon	2 Gerald Place, Rockaway, NJ 07866

☆ Thank-you ☆

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	NAME	ADDRESS
47	Caitlin Wallace	219 Nelson Ave, Beach Haven
48	MARY KANE	34 JEFFREY CT., BASKING RIDGE, N.J.
49	Jessica Horowitz	55 Orchard Lane Colts Neck, NJ 07722
50	John D'Connor	55 Orchard Lane Colts Neck, NJ 07722
51	Leticia Gil	16 48th Street Apt. 1 Weehawken, NJ 07086
52	Robert Profitera	156 Orangeburgh Road Old Tappan, NJ, 07675
53	Valerie Murphy	30 Sylvan Way, West Caldwell, NJ 07006
54	Katrina Gama	8 Laurel LBI
55	Noel Mahon	43 White Oak Ln, LEH NJ 08017
56	Michele Royen	13 W 15th ST. B. H. 08008
57	Shirley Costello	213 Amber St. Bk. Hon. NJ 08008
58	Debra Leigh	14 Janet Rd Holgate, NJ 08008
59	Amy Mutz	PO. Box 540 McAfee NJ 07428
60	Sandi Levon	10 W. Roosevelt Ave Holgate, NJ 08008
61	Meghan McDermott	62 E Linden Ave Dumont NJ 07626
62	Emily McArthur	620 E LINDEN AVE APT 3 ENGLEWOOD NJ 07631
63	Linda Bosse	7074 DR KATONAH NJ 10536
64	Reece Goodson	436 Second St. Beach Haven NJ
65	Erika Marchiondo	3204 South Long Beach Blvd Holgate, NJ
66	Susan Gross	122 Yarmouth Ct. Holgate
67	Jean Genievich	228 Kentford Ave Beach Haven
68	Lorraine Fabiano	21 KILROY Rd NEWTON NJ 08008
69	Donna Livingstone	7827 Farmsworth St Phila Pa 19152


★ Thank-you ★

We, the undersigned, believe the horseshoe crab population and the shorebird population, which feeds on the horseshoe crab eggs, should be protected. Therefore, we strongly urge the Atlantic States Marine Fisheries Commission to **OPPOSE Horseshoe Crab Addendum VII**, which would remove these protections.

	NAME	ADDRESS
70	Linda Colgan	llcolgan@msn.com
71	Miriam Costuto	miriamcostuto22@gmail.com
72	Kurt Russell	kingkurt609@gmail.com
73	Alexa Paul	a.paul.2018@ icloud icloud.com
74	NANO GOYETTE	nano-goyette@bnc.com
75	Kim Pierce	kimbertyspeidel@hotmail.com
76	Kaylan Pierce	kaylanpierce72@gmail.com
77	Siobhan Wath	siobhan-burns2@gmail.com
78	Linda Elm	lindaelm@comcast.net
79	Elizabeth	
80	Laura Bowie	Lbiforshore@aol.com
81	Richard Bowie	Richardbowie@aol.com
82	Elizabeth D'Errico	betnderrico@gmail.com
83	Steph Spano	steph.spano@gmail.com
84	Michelle Paulin	mmpaulin@gmail.com
85	MARY ANNE RIVKIN	K66L9IRL@verizon.net
86	Joe Maffrey	1060 Gaylord Mountain Rd / Hamden Et
87	Mary Anne Maffrey	Jgaffrey7@gmail.com
88	Hannah Dyer	tdydsos@yahoo
89	Merrianne McLoughlin	merrianne.mcloughlin@gmail.com
90	Katelyn McLoughlin	kmcloughlinn@gmail.com
91	Lorraine Shuman	jslshuman82@verizon.net
92	Susan Hillegass	susanmhillegass@gmail.com

Please Sign

We, the undersigned, believe the horseshoe crab population and the shorebird population, which feeds on the horseshoe crab eggs, should be protected. Therefore, we strongly urge the Atlantic States Marine Fisheries Commission to **OPPOSE** Horseshoe Crab Addendum VIII, which would remove these protections.

	NAME	ADDRESS
93	Pam Carr	116 Canal St, New Hope, PA 18938
94	Melinda Wadsworth	23 Messenger Ln Ringoes, NJ 08551
95	Dick MacDonale	401 Bury Ave Pompano Beach FL 33062
96	RUTH D. McLAUGHLIN	4 West Stanton Ave Long Beach Township, N.J. 08008
97	Barbara C. Marcus	115 East 21 st Street Spray Beach, Long Beach Twp, NJ 08008
98	Kym Pearce	105W Roosevelt Ave, Long Beach Township NJ 08008
99	Ginny Williams	929 Oceanfront, Ship Bottom, NJ
100	Maurine Courmaych	425 2nd St. Beach Haven, NJ 08008
101	Greg Guendy	424 Centre St. Beach Haven, NJ 08008
102	NERTH VAN DERUSEN	30 JOSLEO PLACE, HUDSON, NY 12534
103	Robert Stroni	12115 Conkling St Baltimore MD 21224
104	Karen Jachowski	60 Belton St. Stanhope NJ 07874
105	Jan McLennan	900 Vista Dr. West Chester, PA 19380
106	Emily Guglielmo	1140 N Wells unit 206 Chicago, IL 60610
107	Sally Guglielmo	23600 Via Las Palmas Bonita Springs FL 34134
108	Allison Coyle	PO Box 422, Suffern NY 10901
109	Shay Connolly	30 Eleventh St, Beach Haven, 08008
110	Melissa Wall	17 E 92 nd St Beach Haven 08008
111	Sandra Allebach	4873 Spencer Dr., Schwenksville, PA 19473
112	Jan Manthorse	286 Continental Dr, Feltstown, Pa 19464
113	Colleen Skrzat	220 Paperbuck Dr Collegedale PA 19426
114	Denise Ferrigno	112 Astor Dr. Harleysville, PA 19438
115		209 North Atlantic BEACH HAVEN, NJ 08008

★ THANK YOU ★

PLEASE SIGN

We, the undersigned, believe the horseshoe crab population and the shorebird population, which feeds on the horseshoe crab eggs, should be protected. Therefore, we strongly urge the Atlantic States Marine Fisheries Commission to **OPPOSE** Horseshoe Crab Addendum VII, which would remove these protections.

	NAME	ADDRESS
116	STEPHANIE DESISTO	174 PROSPECT AVE REVERE MA 02151
117	BARBARA HARRIMAN	144 old Woods Cr Mahwah NJ 07430
118	ALLAN HARRMAN	4175 DAVIS CUP DR. HUNTINGTON BEACH CA 92649
119	Lori Carroll	6 Janelle Drive Barnegat NJ 08005
120	Krysten Germain	75 Saint Andrews Dr. L.E.H., NJ 08007
121	Emily Stires	49 Putnam St. Unit 1 Somerville MA 02143
122	Manaywendt	12 weygant Hill, Highland Mills, NY 10930
123	Loren Brewi	116 Peaceable Hill Rd. Ridgefield, CT 06872
124	Jayne Resetan	27 Allison St South Plainfield, NJ 07080
125	Corinne Schreiber	6 EVERETT DR. Medford NJ 08055
126	Steph Tell	210 Eon 17th St. Long Beach, CA 90808
127	Andrea Ryan	582A AMBER ST. Beach Haven NJ
128	Janice Baswind	551 Marlin Ave Manasquan NJ 08736
129	Sharon Pappaport	37A Forshee Circle Montvale, NJ 07645
130	Slim Borders	251 Elm Ave Cedar Run, NJ 08092
131	Deborah Davis	2505 Hopewood Lane, Monroe, NC 28110
132	Marilyn Kaufman	4303 S Long Beach Blvd Abingdon NJ 08008
133	Patty Marchant	11 FRANK DR Beach Haven NJ 08008
134	Claudia Couch	41 Rockwood Road Florham Park, NJ 07932
135	Teronika Coakley	521 Ocean Terrace 10301
136	Susan Schreiber	1011 N Atlantic Ave, Beach Haven NJ 08008
137	Rita R. Silverberg	3 Wright Rd Yorktown Heights NY 10598
138	Barb Cytler	1511 Waverly Ave Beach Haven NJ 08008
139	Dena Noone	260 Magnolia Ave, Hillsdale, NJ 07642

THANK YOU! ★

PLEASE SIGN



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	NAME	ADDRESS
140	Aliza Brennan	14 Greenland Ct Princeton NJ 08540
141	Julie Rivera	490 Chestnut Street, Twp of Washington 07676
142	Danielle Kirsch	7 Veteri Place, Wayne NJ 07470
143	Tricia O'Callaghan	275 Engle St., D-3, Englewood, NJ 07631
144	Terry Jasek	12 Roosevelt Ave Trenton NJ 08620
145	Judy Bass	31 Forge Hill Rd Glen Gardner, NJ 08826
146	Karl Bass	" " " " " " " "
147	Allison Bahr	15 Village Green, Budd Lake, NJ 08828
148	CAROL MARKHAM	10361 BRADIGAN RD. FORESTVILLE, NY 14062
149	LAURA HARTMAN	37 LANAI CIR. NAPLES FL 34112
150	Nympa Cole	248 Valley Forge DR LEFT NJ 08087
151	Susan Baptiste	32 Lincoln Ave Blackwood NJ 08012
152	Karen Sherwood	3160 E. 4th Ave Apache Junction AZ 85119
153	Emi Jordan	2354 W University Dr, Mesa, AZ, 85201
154	Danica Jordan	604 S Washington St #1606 Philadelphia, PA 19106
155	Stephanie Aebretsen	658 Thompson Ave. Bound Brook NJ 08805
160	Chris Boletta	246 Knoll Dr Park Ridge NJ 07656
161	Thomas Boletta	" " " " " " " "
162	Jean O'Neill	2111 West Ave, BH 08008
163		
164		
165		
166		

THANK YOU!! ★

STEPHANIE HANSEN
STATE SENATOR
10th District



SENATE
STATE OF DELAWARE
411 LEGISLATIVE AVENUE
DOVER, DELAWARE 19901

COMMITTEES
Environment & Energy, **Chair**
Transportation, **Vice-Chair**
Elections & Government Affairs
Executive
Health & Social Services
Rules & Ethics
Legislative Oversight & Sunset

VIA ELECTRONIC MAIL

Atlantic States Marine Fisheries Commission
1050 N. Highland Street, Suite 200 A-N
Arlington, VA 22201
Comments@asmfc.org

January 24, 2022

RE: Comment on “Revision to the Framework for Adaptive Management of Horseshoe Crab Harvest in the Delaware Bay Inclusive of Red Knot Conservation”

Dear Commissioners:

Thank you for the opportunity to provide comments for the record. I am the State Senator for the 10th Senate District in Delaware and also the Chair of the Delaware Senate Environment and Energy Committee. Prior to serving in this capacity, I was an environmental scientist and hydrologist for the Delaware Department of Natural Resources and Environmental Control (DNREC) for approximately eight (8) years and an environmental attorney in private practice for approximately nineteen (19) years.

As an elected official, I understand how important it is to balance all of the varied interests in any environmental regulatory matter. It is also critically important that all scientific data be made available for review and analysis prior to changing key elements of any management plan affecting critically important species.

I have been following the discussion regarding the harvesting of horseshoe crabs within the Delaware Bay. To that end, I have had a number of discussions with DNREC Fish & Wildlife personnel as well as other environmental organizations in order to do my due diligence in assessing whether a moratorium on horseshoe crab harvesting is warranted within the State of Delaware. Since I have found that there is a split of opinion within the environmental community on whether additional restrictions on horseshoe crab harvesting is necessary, I have asked for additional data from DNREC.

Currently, I am waiting on a report jointly developed by DNREC, the U.S. Geological Survey, and the New Jersey Department of Environmental Protection containing an assessment and estimate of the red knot population that utilized the entire Delaware Bay area during the spring 2021 migration. My understanding is that this report will become available within a few weeks. I am also waiting on data from DNREC regarding red knot body weights in Delaware during spring 2021. As you know, since the red knot bird species is dependent on a healthy horseshoe crab population for food, these are two important criteria for assessing the health of the horseshoe crab population in the Delaware Bay.

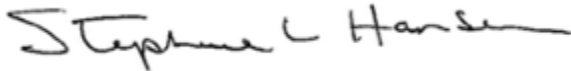
Even though Delaware does not allow horseshoe crab harvesting for biomedical purposes, this harvest occurs in other states. This harvest is of critical importance to our country during this unprecedented time of needing vaccines for our COVID 19 response. Your latest publication with data on the number of horseshoe crabs harvested for this purpose and their mortality is the 2020 Fishing Year, “Review of the Interstate Fishery Management Plan” approved on October 21, 2021. On page 8 of the report, it states:

The 1998 FMP established a biomedical mortality threshold of 57,500 crabs that, if exceeded, requires the Board to consider management action. This threshold was exceeded in 2020. Results of the 2019 Benchmark Stock Assessment indicate that levels of biomedical mortality prior to 2017 (the terminal year of data used in the assessment), which were relatively consistent between 2013-2018 (with the exception of 2016), did not have a significant effect on horseshoe crab population estimates or fishing mortality in the Delaware Bay region. However, the average biomedical mortality in the last three years has been about 40% higher than the 2013-2017 average. (Underlining added).

As the pandemic has raged through 2021 with a concomitant need for more vaccine, it should be expected that the harvest and the mortality will also be significantly increased, although we do not yet have that data. This has been a year of very unusual demand for horseshoe crab blood, much more so than 2020. In order for us not to make a mistake in underestimating the effect of the biomedical industry on the crab population and the future demand on the biomedical industry as we make our way through this unpredictable pandemic, caution is best at this point.

On behalf of the residents in the 10th Senate District and as the Chair of the Delaware Senate Environment and Energy Committee, I would like to respectfully request that any decision to revise the ARM to be less restrictive on the harvesting of horseshoe crabs in the Delaware Bay be delayed until such time as all of the data necessary to assess the health of the horseshoe crab population has been developed and reviewed.

Sincerely,

A handwritten signature in black ink that reads "Stephanie L. Hansen". The signature is written in a cursive, flowing style.

Senator Stephanie Hansen, 10th District



Ravi Grover
PO Box 802103
Chicago, IL 60680

S SUBURBAN, IL 604

8 SEP 2022 PM 7 L



Re: Horseshoe Crab Draft Addendum VIII

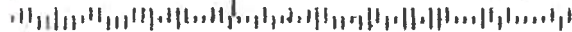
Please protect red knot shorebirds by rejecting Addendum VIII to the fishery management plan for horseshoe crabs.

Not doing so opens the door to violations of ESA given the low # of red knots that have decreased because of less crabs.

Thank you.

ASMF
1050 N Highland Ste 200
Arlington, VA
22201

22201-219650





The Valley Forge Audubon Society joins NJ Audubon in opposing the Atlantic States Marine Fisheries Commission's (ASMFC) proposal to increase the harvest of horseshoe crabs, including a possible renewed harvest of females. Horseshoe crab eggs provide essential food for migrating federally-threatened Red Knots, whose numbers along Delaware Bay have plummeted from more than 90,000 in the 1990s to only 12,000 this year and an estimated all-time low of 6,800 in 2021. Increasing the harvest will have a significant negative impact on Red Knots and other shorebird species that depend on horseshoe crab eggs during spring migration stopovers in Delaware Bay, putting them at risk of further population declines.

We hope to enjoy visiting the Delaware Bay for many years to experience the Red Knot stopover on their amazing 9,000 mile migration from the southernmost tip of South America to their nesting area in the middle- and high-Arctic areas of northern Canada. Help ensure that these remarkable birds get all the horseshoe crab eggs they need to thrive and grow as a species for generations to come. Please do not increase the harvest of horseshoe crabs.

Sincerely,

A handwritten signature in black ink, appearing to read "V.A.S.", written over a light blue horizontal line.

Vincent Smith, President
Valley Forge Audubon Society



AMERICAN LITTORAL SOCIETY

18 Hartshorne Drive, Suite 1, Highlands, NJ 07732

January 24, 2022
Mr. Joseph Cimino, Chair
Horseshoe Crab Management Board
Atlantic States Marine Fisheries Commission

By Email

Mr. Cimino,

I am writing to express the deep concerns of the American Littoral Society regarding the possible action by ASMFC at its Winter Meeting of the Horseshoe Crab Management Board to substantially modify the policies and approaches to protecting the crabs and red knots of Delaware Bay through a highly-technical modification to the Adaptive Resource Model (ARM) utilized by the Commission.

The impact of the possible technical revisions – to change the harvest restrictions and reopen the bait fishery’s access to female horseshoe crabs despite the lack of recovery to date of the red knot populations which depend on the eggs they produce – is buried under hundreds of pages of technical discussions despite the efforts of leading members of the ASMFC’s own advisory committee to raise this concern to the primacy it deserves. Further, this fundamental change in policy and risk to the recovery of the red knot is being done behind the closed doors of the modeling committees without robust and engaged public consideration of the acceptability of the risk to important stakeholders including the broader public and conservation community.

The fact that the representative of the agency charged with protecting the red knot under the Endangered Species Act was forced to write a “minority report” to ensure her concerns – substantially ignored during the process - were on the record is an indictment of the process. Truly, how can your committee consider this process appropriate to move forward when the professionals entrusted to protect the species of concern find it unacceptable? Even in the face of warnings that the course the ASMFC is setting upon may not satisfy its legal obligations under the Endangered Species Act, the originating technical committees have simply countered the concerns with their perspectives and moved ahead. Even the outside Peer Review Committee raises concerns about the shift in policy embedded in technical changes and the adequacy of how well public and stakeholder concerns were taken into account. I doubt that the public’s tolerance to the possibility of red knot extinction is as high as this new ASMFC direction envisions.

I strongly urge the Commission to not approve the proposed Framework Revision before you for consideration on January 26, 2022.

Sincerely,

A handwritten signature in black ink that reads "Tim".

Tim Dillingham, Executive Director

(732) 291-0055 www.littoralsociety.org

From: [Robert Szuter](#)
To: [Comments](#)
Subject: Horseshoe Crab Draft Addendum VIII

Dear ASMFC,

I urge the Atlantic States Marine Fisheries Commission (ASMFC) to not backtrack and allow for the killing of female horseshoe crabs for fishing bait. I urge the ASMFC to keep protections in place and if anything, to strengthen protections - as the situation is dire in our beloved Delaware Bay for the shorebirds and the horseshoe crabs. Please abandon any attempts to weaken the current moratorium on horseshoe crab harvest.

- Under the current framework there is no female crab harvest until female abundance reaches 11.2 million crabs or until the Delaware Bay total red knot stopover population reaches 81,900 birds. The proposed revision would allow the resumption of the female harvest, even though neither the red knot nor female horseshoe crabs of Delaware Bay are close to satisfying either metric.
- The ASMFC should ensure that the original safeguards in their harvest policies prohibiting female horseshoe crabs from being harvested until red knot numbers recover are included in any new policies.

I request that any future public meetings on the horseshoe crab harvest I be notified directly so I may be able to better defend the crabs from the very agency that should be protecting this species in the first place.

Thank you for your time and consideration.

Sincerely,
Robert Szuter
robo.szuter@yahoo.com

135 Lenox Avenue
Hamilton Township, NJ 08620
United States



Position Statement on ASMFC Horseshoe Crab Draft Amendment VIII September 2022

- The Horseshoe Crab Recovery Coalition strongly opposes the Atlantic States Marine Fisheries Commission's (ASMFC) plan to change its Horseshoe Crab Fishery Management Plan, a move that would raise quotas on the killing of horseshoe crabs for use as bait by potentially reopening the harvest to include female horseshoe crabs.
- We remain concerned that the underlying data supporting the new draft addendum to the plan has still not been released to the public, so that conservation groups and concerned citizens have no way to truly understand the science on which the new proposal is based.
- Under the current framework there is no female crab harvest until female abundance reaches 11.2 million crabs or until the Delaware Bay total red knot stopover population reaches 81,900 birds. The proposed revision would allow the resumption of the female harvest, even though neither the red knot nor female horseshoe crabs of Delaware Bay are close to satisfying either metric.
- How can we comment meaningfully on a proposal when you are not releasing the data supporting the types of increases being proposed? With both red knots and horseshoe crabs at historically low numbers, we cannot take the commission's assertions on faith.
- Based on field work, including egg density studies conducted by the Delaware Bay Shorebird Project and other organizations, we do not believe that horseshoe crab populations are recovering from their population crash in the 1990s. Egg density data is the most reliable indicator of the horseshoe crab population, and importantly, it is the most reliable index of value for red knots and other shorebirds. Yet ASMFC has never included these surveys in its modeling. Making matters worse, ASMFC also does not include field survey data for Red Knots, and these show that Red Knot populations are at historic lows. In the 1990s, more than 90,000 could be found along Delaware Bay. This year, only 12,000 were counted, and in 2021, the number was estimated at an all-time low of 6,800. Evidence is now emerging that Red Knots are bypassing the Delaware Bay stopover altogether in search of life-sustaining food sources elsewhere. This makes their migratory journey all the more perilous.
- Shorebirds like the red knot are plummeting toward catastrophe, with their declines representing the world's number one conservation crisis facing birds today. And the killing of female horseshoe crabs all but assures that their population levels will never rebound.
- The joint collapse of red knots and horseshoe crabs is not inevitable. But this proposal propels them closer to that grim reality.

Caitlin Starks, Senior FMP Coordinator

1050 N. Highland Street

Suite 200A-N

Arlington, VA 22201

RE: Comment on Horseshoe Crab Draft Addendum VIII

30 September 2022

Dear Ms. Starks, and ASMFC Commissioners,

I am writing to express my concern over the possible acceptance of Draft Addendum VIII to the Horseshoe Crab Management Plan. I work as part of the Delaware Bay Shorebird Project, rescue horseshoe crabs as part of reTURN the Favor, have been helping conduct horseshoe crab spawning surveys and tagging for the past 9 years, measure horseshoe crab egg density on the NJ side of Delaware Bay, and work for the Horseshoe Crab Recovery Coalition. My comments today are not in affiliation with any of the aforementioned organizations, but instead are my own concerns as an individual and observer, who has been working, in the field, directly, with horseshoe crabs, in many respects.

I am opposed to Option B to implement the revision to the Adaptive Resource Management (ARM) Framework, and ask that commissioners vote no on Addendum VIII.

In your slides for the Horseshoe Crab Draft Addendum VIII Hearing Presentation, you state: "The ARM Framework ... provides ... sufficient resources to maintain viable populations of red knots." Oxford Languages defines viable as "capable of working successfully." In biological applications, it defines viable as "capable of living successfully." To cite more than one source, the Cambridge Dictionary defines viable as "able to succeed."

Being that the *rufa* Red Knot subspecies has been listed as Threatened under the Endangered Species Act since 2015, it is clear that the population of red knots that migrate through and feed in Delaware Bay are not living successfully. One might classify a species which is living successfully as one not included on the International Union for Conservation of Nature's Red List of Threatened Species, as a species at risk for becoming extinct.

In an article printed in NJ Spotlight News on 6/14/22, the Commission was quoted as saying the passage population of red knots is "fairly stable but lower than desired." What percentage of the red knot population of Delaware Bay were above the 180g weight to successfully make the trip to the Arctic breeding grounds? The estimation of P180 (the percentage of birds that gain enough weight to breed in the Arctic successfully) has not broken 45% in the last 5 years. When horseshoe crab egg densities were higher, over 80% of red knots reached good weight.

You also state that one of the objectives of the ARM Framework is to maintain ecosystem integrity. The horseshoe crab is a keystone species of the ecosystem, supplying a vital food source not only to migrating red knots, but also to shorebirds, and many species of (sport)fish, such as Weakfish, Tautog, Striped Killifish and Atlantic Silversides, who in turn are eaten by Striped Bass and Summer Flounder. Since the new model is capable of allowing a female harvest, depletion of the food source of horseshoe crab eggs (which can only be provided by females) crucial for so many species, is bound to have a deleterious effect on the integrity of the Delaware Bay ecosystem, at multiple levels. Since the decline of the horseshoe crab population in the 1990s, there has been a resultant decline in sportfishing. This would only decrease further with implementation of the new model and a female harvest.

The Commission counts red knot numbers at around 43,000, using a model-based assessment. You admit that this is a “best estimate.” Scientists with the Delaware Bay Shorebird Project are in the field, collecting data that is ground-**truth**, not an estimate, and not a model. Tet you refuse to use these population numbers. You quiet the voices on the advisory committee who speak the voice of truth in minority reports. You say that your estimate of 43,000 red knots is “a level that is consistent with state quotas for harvesting horseshoe crabs.” This only shows that the harvest quotas are excessive, as there hasn’t been 43,000 red knots on Delaware Bay since the 1990s.

In addition to my comments listed above, I will state that there has been no opportunity for the model to be made available to be reviewed by those requesting to do so. The reason being given that it takes three computers to run is absurd. Certainly, you recognized this limitation when you chose the cumbersome model.

Under the current ARM framework, females would not be harvested until the population meets a threshold of 11.2 million female horseshoe crabs, or the total red knot stopover reaches 81,900 birds. However, neither of these conditions have been reached. In addition, the Virginia Tech trawl survey, recognized by the Commission to help estimate the horseshoe crab population, shows that the population of female horseshoe crabs is depleted.

For these reasons, I ask the Commission not to approve the proposed Framework Revision of Draft Addendum VIII at this time.

Respectfully Submitted,

Susan Linder

From: [John Askildsen](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Harvest
Date: Sunday, September 11, 2022 5:24:27 PM

To whom it may concern,

I oppose Horseshoe Crab harvests until the Delaware Bay crab population and Red Knot population are rebounded. To allow this event to happen, would be a detriment to the Horseshoe Crab and Red Knot population, and also financially counter productive to aims of the Endangered Species Act and any other federal programs aimed at rejuvenating the red knot population in the Delaware Bay region. We cannot afford to allow this harvest to happen. Please count me in as being opposed to any such harvest.

John Askildsen
70 Daheim Road
Millbrook, NY 12545

From: [Jen Zarcone](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Friday, September 30, 2022 4:26:14 PM

To whom it may concern,

As a board member of a local wildlife conservation non-profit who has been collecting data with my own two hands and eyes for many years on the New Jersey shore, I am writing to say that I vigorously oppose the Atlantic States Marine Fisheries Commission's (ASMFC) proposed Addendum VIII Interstate Horseshoe Crab Fishery Management Plan, which would increase the number of horseshoe crabs harvested for use as bait and potentially reopen the harvest to include female horseshoe crabs. I urge the commissioners to vote no on Addendum VIII because I believe several indicators show both horseshoe crab populations themselves and the population of a Federally threatened shorebird, the red knot that depends on horseshoe crabs, are well below recovery thresholds.

I base my opposition on three factors:

- I have yet to see the model upon which the proposed revision is based, so there is no way of objectively verifying its accuracy.
- Horseshoe crab populations remain at historic lows, and their ongoing use both for bait and biomedical purposes all but assures they will not recover to their historic population levels.
- Rufa Red Knot populations are at all-time lows from both a changing climate and the increasing scarcity of the food needed to fuel their 9,000-mile migration.

Among the most worrisome aspects of the proposed addendum is that the public has yet to see the model upon which it is based. Even if granted access at this late date, we do not believe the September 30, 2022, comment deadline would be sufficient time to independently analyze its accuracy. Such a release would serve the interests of science and spur important public debate about your proposed actions, and should have been a prerequisite for ensuring fully informed public commenting.

I am also highly concerned that the proposed revision would likely trigger a resumption in the harvest of female horseshoe crabs, which would make recovery of the species virtually impossible. Under the current ASMFC framework, there is no female crab harvest until female abundance reaches 11.2 million crabs or until the Delaware Bay total red knot stopover population reaches 81,900 birds. Neither red knot nor horseshoe crab populations are anywhere close to satisfying either metric, and yet, under this addendum, female harvest could be allowed.

The joint collapse of red knots and horseshoe crabs is not inevitable. But the draft addendum propels them closer to that grim reality. I urge you to abandon this proposal by voting no on Addendum VIII, and instead urge you to begin the process anew by:

- Incorporating into the model datasets that show a more robust picture of population status for horseshoe crabs and red knots, including horseshoe crab egg density surveys and red knot field surveys.
- Publicly sharing the model behind the proposal, allowing for sufficient time for independent analysis before public commenting.

Thank you,

Jennifer Zarcone

--

Jennifer Zarcone

Save Coastal Wildlife

Board of Directors

jen.zarcone@gmail.com

917-857-7751

www.savecoastalwildlife.com



From: [Zach Piper](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Tuesday, September 27, 2022 1:30:51 PM

Dear ASMFC,

Please protect the Delaware Bay by not allowing the harvest of female horseshoe crabs for bait. I work as a fisheries biologist in Middletown, Delaware for Environmental Consulting Services, Inc. and have been an avid hunter and fisherman since moving to the area a little over 5 years ago. In speaking to lifelong residents and colleagues, it is my understanding that the horseshoe crab population in Delaware would not be able to sustain the harvest of females being proposed. In my opinion, the trade-off between using these keystone species as bait and allowing their numbers to recover could not be any more stark. With red knot and other migratory bird populations hurting, it would be a poor decision to remove even more horseshoe crabs from the ecosystem and decrease spawning numbers for a whelk fishery that does not carry the same magnitude of importance as healthy horseshoe crab numbers. I know you have difficult decisions to make managing our coastal fisheries but this seems like a no-brainer.

Thank you and have a great day,
Zach Piper

From: [A Piatek](#)
To: [Comments](#)
Subject: [External] Proposed Increase in Horseshoe Crab Harvesting
Date: Sunday, September 11, 2022 4:14:59 PM

Dear Officials of ASMFC,

I urge you to oppose the increase of female horseshoe crab harvesting. Research has shown that neither the horseshoe crab nor the Red Knot have viably increased their population. The Red Knot experiences an exhaustively long and perilous journey from the Southern Hemisphere, resting and restoring their depleted reserves in the Delaware Bay, before continuing their journey further North. The Red Knot depends on the sustenance of the horseshoe crab. In turn, they are important to the health of our ecosystem. They continue to present in decreased numbers and the increase in harvesting will only add to the fragility of these creatures and their and our ecosystem. We humans are interdependent upon the natural systems. I strongly urge the organization to oppose this folly in judgement.

Respectfully Submitted,
A Very Concerned Citizen,
Alice Piatek
Oak Ridge NJ 07438

From: [Amanda MacKaye](#)
To: [Comments](#)
Subject: [External] Protect Horseshoe Crabs
Date: Thursday, September 29, 2022 7:18:09 PM

Hello,

When I was a child I would routinely see Horseshoe crabs both on the beach and in the water. My 22 year old son has never seen one, nor has even seen a shell remaining after birds have feasted.

Please do not change quotas on how many Horseshoe crabs can be killed. In fact, I ask you to please ban the killing of Horseshoe crabs to be used for fishing bait.

Sincerely,
Amanda MacKaye
Arlington, VA

[Sent from Yahoo Mail for iPhone](#)

From: [Andrea Kerin](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Tuesday, September 27, 2022 2:10:55 PM

Dear Commissioners,

I write in objection to the Atlantic States Marine Fisheries Commission's (ASMFC) proposed changes to the Adaptive Resource Management (ARM) model which seek to resume harvest of female horseshoe crabs and raise the quotas on killing horseshoe crabs for bait in commercial fisheries.

The current ARM model framework advises no female crab harvest until female abundance reaches 11.2 million crabs. The proposed changes to the model will estimate a higher population of female crabs and likely allow female harvest to resume.

The current ARM model also advises no female crab harvest until the Delaware Bay stopover population of Red Knot, a federally threatened shorebird species that depends on horseshoe crab eggs to survive, reaches 81,900 birds. A 2021 superpopulation estimate puts the Red Knot population at 42,271 – less than half of ASMFC's current recommended threshold for female horseshoe crab harvest to continue. *Independent assessments estimate the Red Knot population to be even lower.*

Despite a stagnant Horseshoe Crab population and a record low stopover population of the Red Knot, the ASMFC is set to open the door to an even more damaging horseshoe crab harvest.

The ASMFC has not released the data behind the proposed changes, preventing meaningful public review before a decision for approval is made.

Commercial fisheries pressure must not dictate resource management policy. With such low numbers of horseshoe crabs it is not a stretch to also predict population collapse in sport fish like striped bass and summer flounder that consume horseshoe crab eggs as well as other fish that are more heavily reliant on horseshoe crab eggs, like weakfish, American eel, and striped killifish.

Please do the right thing by our fragile environment and protect horseshoe crabs properly. Do not resume harvest of female horseshoe crabs and do not increase quotas on killing horseshoe crabs.

Sincerely,

Andrea Kerin
801 Eleven O'Clock Road
Fairfield, CT 06824

From: [Andrew Ashburn](#)
To: [Comments](#)
Subject: [External] Comment on Horseshoe Crab Draft Addendum VIII
Date: Friday, September 30, 2022 9:05:03 AM

To whom it may concern (dear commissioners),

Horseshoe crabs are vital to our Delaware Bay ecosystems. As such, female Horseshoe crabs are even more essential, as it is their deed & duty to provide all the necessary energy & efforts to create the next generation, with brief input from males. As Horseshoe crab populations are not nearly recovered to historical records from pressures of pollution, habitat loss, and overfishing, it is imperative that we not remove their progenitors. This is doubly true if the reason for their harvest is simply to supply means of further extraction from Our bay and its estuaries.

These beings have been part of Earth's marine ecosystems for millions of years. How could we creatures of recent emergence possibly understand their profound importance. Their lifecycle is inextricably linked to a myriad of now rare and otherwise endangered species who depend on their habits & services.

It would be a total failure to ourselves & future generations to risk losing functionally sound populations of Horseshoe crabs for short sighted profits. Our bay's food-chains cannot survive the depletion or eliminations of Horseshoe crabs

Thank you for your time & attention,
Andrew Ashburn
Lewes, DE 19958

From: [Andrea Bonette](#)
To: [Comments](#)
Subject: [External] Protecting Horseshoe Crabs
Date: Thursday, September 1, 2022 10:02:17 AM

Sent from [Mail](#) for Windows

Please do not allow the current protections for horseshoe crabs to be weakened. They may not be as pretty to look at as other endangered species, but they still hold a key place in the Atlantic Ocean's ecosystem. I was so happy years ago when New Jersey outlawed catching them for bait at a time when literally truckloads of them were carted away every spring. It's partly about the migrating red knot birds but the larger issue is the whole system which faces so many human-made dangers.

It's very disappointing that Delaware has not done the right thing but I know you have no control over that.

Thank you.

Andrea M Bonette

From: [Andrew Dorman](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Friday, September 9, 2022 2:43:30 PM

To whom it may concern,

I am writing you as a concerned citizen and resident of New Jersey where Horseshoe crabs have enjoyed miles of our coastlines to breed and keep their species going strong for millions of years. Additionally Red knots, a now threatened species, rely on horseshoe crabs eggs for the survival of their own species.

The ASMFC has been right to observe the moratorium of fishing horseshoe crab females. While the public is open to exploring new scientific models, we should not risk adversely impacting the populations of these two species.

Please ensure that any plans for harvesting horseshoe crabs maintains a full moratorium for against harvesting females and perhaps considering other alternatives as bait.

I support sustainable fisheries an the ASMFC's efforts to do that. But we must not do so at the cost of other species like the horseshoe crab or the red knot!

Sincerely,
Andrew Dorman
3 Bedford Ct
East Brunswick, NJ 08816

Sent from my iPhone

From: [Andrew Sharo](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Wednesday, September 14, 2022 9:58:37 PM

Dear Ms. Caitlin Starks,

I am a postdoctoral fellow with the NSF, currently working in conservation genetics at the University of California, Santa Cruz. I urge the commissioners to vote no on Horseshoe Crab Draft Addendum VIII. Horseshoe crabs are still below their recovery population goals, and we should do everything we can to reduce the killing of horseshoe crabs. A federally threatened seabird, the red knot, also depends on the horseshoe crab. Please vote no to preserve the horseshoe crab, a valuable part of the Atlantic ecosystem.

Best Regards,
Andrew Sharo, PhD

From: [Ann Harmer](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab harvest
Date: Thursday, September 15, 2022 11:03:36 AM

To whom it may concern:

Horseshoe crabs have been around for millions of years. Are we the species who will cause their extinction? For SO many reasons, please stop over-harvesting these animals and allow them, and the many other critters that depend on them for survival, to survive as well.

These critters have been around for--quite literally--hundreds of millions of years. Will we be the species that makes them extinct? I certainly hope we have more sense, but I'm beginning to doubt it--given the state of the nation. Please, for SO many reasons, stop the harvest--or at least severely limit it--before it is too late.

Ann Harmer
Professor Emeritus, Biological Sciences
Orange Coast College
Costa Mesa, CA 92626

From: [Ann Bastian](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Protection Addendum VIII
Date: Thursday, September 15, 2022 7:41:57 PM

I join thousands in urging you to oppose any increase in the horseshoe crab harvest. Please join us in protecting the red knot and other shorebirds that depend on horseshoe crab eggs. Extinction is irreversible.

Sincerely, Ann Bastian, 21 Ballantine Ln., Skillman NJ 08558

From: [Optimum](#)
To: [Comments](#)
Subject: [External] Horse shoe crabs
Date: Monday, September 12, 2022 8:46:03 AM

Please do not allow more harvesting of these crabs. Studies indicate that the crabs have not recovered enough to warrant an extension. Red knot populations that rely on crab eggs to replenish their nutrition during migration are down. There must be pressure from fisherman to allow more harvesting of crabs. They must look elsewhere for their bait.

Ann Orsillo

Sent from my iPad

From: [Anna Kularski](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Harvest
Date: Friday, September 30, 2022 7:04:51 AM

What is wrong with you people!

Horseshoe crabs? What are you going to do with them; catch conch? Give me a break.

Horseshoe crabs are possibly the most ancient form of animal life gracing this planet. They've managed to survive for hundreds of millions of years - through 5 extinction events and now you are basically proposing to wipe them off the face of the earth.

Please; think again.

Anna Kularski

From: [Anne Hoban](#)
To: [Comments](#)
Subject: [External] Harvesting Female Horseshoe Crabs
Date: Tuesday, September 6, 2022 1:21:37 PM

I am writing regarding the preservation of existing harvest levels of female horseshoe crabs. Removing the threshold will be detrimental to the red knot population and their successful migration.

I don't need to say more. You know the issue. It is up to you to make the right decision.

Anne Hoban
463A New Haven Way
Monroe Township, NJ 08831
215-962-5894

From: [Douglas Price](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum
Date: Sunday, September 11, 2022 2:56:44 PM

I oppose the Atlantic States Marine Fisheries Commission's proposal to increase the harvest of horseshoe crabs. I oppose the harvest of female horseshoe crabs. These actions will have a significant impact on the population of Red Knots (a federally protected bird species) as well as other shorebirds that rely on horseshoe crab eggs to fuel their migration. You are putting the populations of these species at risk. Please stop the increase in the harvest and please formally ban the harvest of all female horseshoe crabs.

Sincerely,

Anne Price, Monroe Township, NJ

From: [Anne Sturm](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Sunday, September 11, 2022 7:45:42 PM

I am a member of the NJ Audubon Society living in Maryland. A life long bird conservationist, now at eighty years of age, it seems we have always been worried about the horseshoe crab over harvesting. Surely, we can put science into duplicating what we drain from the crabs every year and save them as well as the federally threatened Red Know and other shorebirds that rely on the horseshoe crab eggs during spring migration stopovers on the Delaware Bay. We know that most birds are in decline but particularly shore birds like Red Knots. I oppose the Atlantic States Marine Fisheries Commission's proposal to increase the harvest of horseshoe crabs, including the harvest of females for the first time in over a decade. Please deny this request.

Sincerely,

Anne Sturm
P.O. Box 341
Barnesville, MD. 20838



From: [The Dinosaur Specialist](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Wednesday, August 31, 2022 8:35:22 AM

Hello,

I kindly request you not to harvest female horseshoe crabs, as they are a vital part of the Red Knot's diet. Please wait until the red knot population is stable, which it will be in a few years. I know that your economy depends on horseshoe crabs, but do you want a better future or more food? The choice is yours.

Don't do it,
9002birdwatcher

From: [Ari Casalini](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Monday, August 22, 2022 2:09:43 PM

Hi,

I'm writing in protest to ASMFC's proposal to allow harvesting of female horseshoe crabs. Horseshoe crabs are an important part of the coastline ecosystem. By allowing the harvesting of female horseshoe crabs, you would be throwing off an already fragile balance and possibly greatly diminishing the amount of horseshoe crabs in existence. In turn, this would effect the migratory birds who depend on horseshoes crab's eggs to fuel their migration. As well as the medical practices that rely on the blood of horses crabs for important testing. I think ASMFC should rethink their proposal, for the benefit of all the ecosystems reliant on the existence and continual well-being of horseshoe crabs.

Thank you for your time,

- Ari, age 15, and her family

From: [Anthony Klock](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII.
Date: Monday, September 12, 2022 8:43:03 AM

No!

--

Mr. Anthony Klock
Kresson School
Enrichment Teacher
VTEA President
33rd Year Serving Voorhees Students

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From: [turunc A](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Friday, September 30, 2022 9:38:32 PM

Please do NOT include female horseshoe crabs in the new harvesting plan. They lay thousands of eggs every year and are critical for migrating birds as well as ensuring that the horseshoe crabs don't end up being overharvested again.

Thank you!!

~Bahar

•••Wear gratitude like a cloak and it will feed every corner of your life•••

iPhone ... iTypos ... iApologize ...

From: [Barbara Holm](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Thursday, September 29, 2022 1:56:57 PM

I've been surveying the spawning horseshoe crabs on Delaware Bay for the past 20 years. Spawning numbers have risen in the past 2 or 3 years because the animals hatched out the first year of the ban on harvesting them have now reached sexual maturity. It takes 7 years for a male to reach spawning age and 10 years for a female. This is not the time to remove restrictions. Give the population a chance to recover - it will take about 10 more years till the horseshoe crabs hatched out this year are able to reproduce. To relax restrictions now will stop the animals' recovery just as it gets started. Barbara Holm

From: [Arthur SanFilippo](#)
To: [Comments](#)
Subject: [External] Horseshoe crab protection
Date: Sunday, September 11, 2022 4:08:16 PM

I oppose opening up the harvest of horseshoe crab at this time. The crab remains a disadvantaged species and it is clear this animal has not made a significant return to healthy population.

There are no advantages to use this animal as a bait animal over other types of bait.

There are no advantages to use this animal as a byproduct for man made materials.

Please recognize that you would irreparably harm the stock of this animal in the Delaware bay by allowing additional harvesting

Arthur SanFilippo
154 Florida Ave
Villas NJ

From: [Barbara Morgan](#)
To: [Comments](#)
Subject: [External] Horshoe Crab Draft Addendum VIII
Date: Monday, September 12, 2022 6:16:09 AM

Dear ASMFC:

I am concerned about the dwindling numbers of horseshoe crabs and red knot birds. It makes no biological sense to harvest female crabs until excessive crab eggs and birds return to their 1980's density. One way we can protect them is to not allow harvests of horshoe crabs because they provide the eggs the birds need. Please, ASMFC, please keep your current policy protections for female horseshoe crabs.

Thank you.
Barbara Morgan
65 Whitefield
Unit 210
Ocean Grove,
NJ 07756
Barbara.morgan@gmail.com

Sent from my iPhone

From: barbara.sachau
To: Comments: info@nyclass.org; westchesterhumane@gmail.com
Cc: PETA.Info; INFO; Erica.Meier; Mercy.For.Animals; info@sierraclub.org
Subject: [External] Re: [TAKE ACTION] Oppose Change to Delaware Bay Horseshoe Crab Harvest
Date: Saturday, August 27, 2022 2:17:45 PM

there should be zero harvesting by profiteers of any horseshoe crabs in the entire region of nj ny delaware and all suchpointjs where redknot birds stop. the fact is the big pharma pfofiteers are not being watched and they are taking and killing the female horseshoe crabs in far far greater quantities than we know about nobody watches them, nobody puta limit on big pharma these days. they cannot be trusted at all. they canmake the solution for testing through artificiaal means so they shoudl do that. they shoudl be immediately prohibityed from taking any horseshoe crabs at all. big pharma of course does not want to do this because it will cost them some money and they want to get the horsexhoe crabs for free and pay nothing, which is what they are doing

meanwhile big pharma is ruinng bird populations. that cannot be allowed. stop big pharma from harvesting any horseshoe crabs. save the red knot bird, which is a lovely bird. it deserves full protection. this commetn is for thepublic recor.d please receipt. jekanpublee
jeanpublic1@gmail.com

On Tue, Aug 23, 2022 at 12:56 PM jean public <jeanpublic1@gmail.com> wrote:
bsa

On Tue, Aug 23, 2022 at 10:10 AM Tim Dillingham <info@littoralsociety.org> wrote:

Dear Jean,

TAKE ACTION: Add your voice to ours in opposing the Atlantic States Marine Fisheries Commission (ASMFC) proposal that would endanger Delaware Bay horseshoe crabs and the migratory shorebirds (like the Red Knot) which depend on them.

Overharvesting of horseshoe crabs by the bait and biomedical industries has put a severe strain on the ecological connection between horseshoe crabs and shorebirds like the threatened Red Knot. Although the Red Knot population is perilously low, the ASMFC has proposed allowing the harvest of female horseshoe crabs, whose eggs provide the food that fuels the final leg of the birds' journey to Arctic nesting grounds.

The next step in the ASMFC decision-making process on changing horseshoe crab harvest controls involves public hearings at agencies from the states along Delaware Bay, including New Jersey and Delaware (details below). Anyone can attend the hearings or submit comments via email or mail.

ACT NOW: Here's how to join us in urging the ASMFC to reject the proposed harvest change at public meetings and in writing:

- Attend an upcoming public hearing
- Register to join a webinar for the public hearings
- Submit comments by email or in writing

Live webinars of the public meetings will be held on **Wednesday, Sept. 7 at 6 p.m.**, with NJ Department of Environmental Protection; and **Thursday, Sept. 8 at 6 p.m.**, with the Delaware Division of Fish and Wildlife. Although the meetings are being conducted by agencies in those states, anyone can attend and comment.

[Register for a webinar.](#)

In order to comment during virtual webinar hearings you will need to use your computer or download the GoToWebinar app for your smart phone. Those joining by phone (audio only) will be limited to listening to the presentation and will not be able to provide input. In those cases, you can send your comments to staff via [email](#), U.S. mail, or fax at any time during the public comment period. To attend the webinar in listen only mode, dial 213.929.4221 and enter access code 667-452-901.

Public comment in writing will be accepted until **11:59 PM (EDT) on September 30** and should be sent to Caitlin Starks, Senior FMP Coordinator, at 1050 N. Highland St., Suite 200 A-N, Arlington, Virginia 22201; or at comments@asmfc.org (Subject line: Horseshoe Crab Draft Addendum VIII).

Thank you for you all you do to protect the crabs and birds we love,

Tim Dillingham
Executive Director
American Littoral Society

[LEARN MORE ABOUT THIS PROPOSED CHANGE](#)

Our Contact Information

The American Littoral Society
18 Hartshorne Drive
Highlands, NJ 07732
732-291-0055
<http://www.littoralsociety.org>

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From: [Barry Bendar](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Thursday, September 22, 2022 10:58:24 PM

Hello,

When I was growing up in Monmouth County, NJ, we would go swimming in lower New York Bay, and there were dozens of Horeshoe Crabs all over the beach. Due to the uncontrolled harvesting of these ancient creatures, now that area is completely barren of them. Currently, on the eastern side of New Jersey, there is nary a one to be found. Please do not allow the restrictions on harvesting Horseshoe Crabs in Delaware Bay to be altered in any way. These animals have been on this planet unchanged since dinosaurs shared it with them. Do not risk letting mankind wipe them from existence.

Thank You for your attention,

**Barry Bendar
122 Bay Avenue
Forked River, NJ 08731
(609) 276-3183**

From: [Beate Pohlig](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Friday, September 30, 2022 5:19:23 PM

Dear Sir or Madam:

I strongly oppose the proposed addendum to ASMFC's fisheries management plan allowing for the taking of female horseshoe crabs for fish bait.

As noted in the August 4 National Geographic article *Horseshoe crab blood saves lives*. ***Can we protect these animals from ourselves?***, the full repercussions of crab harvesting are **still** not understood.

Industry self-reporting is a dubious metric for management purposes, seldom accurate and never objective in protecting the interests of any other entity than the industry itself. I know this well from my professional experience working with global companies on social responsibility programs.

Simply put, the number of horseshoe crabs killed each year by humans is not known.

What is known is that populations of birds that rely on horseshoe crab eggs are sharply declining. That metric is irrefutable.

ASMFC cannot make decisions without reliable data. To trust the reporting of for-profit entities over the information provided by bird and conservation groups is a gamble in the wrong direction.

I urge you to reject the addendum on the basis that the evidence supporting an increase in catch is uncertain.

Thank you for your kind attention and thorough consideration.

Best regards,

Beate Pohlig

509 Mallow Road

Villas, NJ 08251

From: [Beate Pohlig](#)
To: [Comments](#)
Subject: [External] oppose the proposed addendum
Date: Friday, September 30, 2022 5:20:25 PM

Dear Sir or Madam:

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I urge you to reject the addendum on the basis that the evidence supporting an increase in catch is uncertain.

Thank you for your kind attention and thorough consideration.

Best regards,

Beate Pohlig

509 Mallow Road

Villas, NJ 08251

From: [Bernard Gurman](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Genocide
Date: Sunday, September 11, 2022 12:32:23 PM

I cannot believe that, once again, the destruction of the crab population is at hand. Really? Why should greed take precedence over nature? Given the changes in the environment and the health of the coastal sea, now is certainly not worth endangering any sea-life.

--

More than 38 million people, including 12 million children, in the United States don't have enough to eat, according to the U.S. Department of Agriculture, which oversees the country's food-stamp program.

From: [BETTY BUTLER](#)
To: [Comments](#)
Subject: [External] Horseshoe crab harvest
Date: Sunday, September 11, 2022 1:32:21 PM

Under no circumstances increase horseshoe crab “harvest”.
Positive population increase depends upon allowing protected
Population increase.

Sent from my iPad

From: [William Marella](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Wednesday, September 28, 2022 5:29:59 AM

Please consider adopting the CIB recommendations to prohibit harvesting of female horseshoe crabs. Current practice is not sustainable.

Bill Marella
Lewes, DE

Sent from my iPhone

From: [Bill Leary](#)
To: [Comments](#)
Subject: [External] Horseshoe crab harvest
Date: Sunday, September 11, 2022 1:33:55 PM

To whom it may concern,
I am opposed to altering the current regulation on horseshoe crab harvest.
Bill Leary
North Haledon, NJ

Sent from my iPhone

From: [william nierstedt](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Monday, September 5, 2022 4:50:19 PM

I send this email as my comment on the draft Horseshoe Crab Fishery Management Plan Addendum VIII. Bottom line – I urge the Commission not to change its current regulatory policy which prohibits the taking of female horseshoe crabs until the populations of both horseshoe crabs and red knots return to accepted levels for continuation of the species with reduced harvesting.

I understand that the main point of this addendum is to switch to a new scientific model for assessing horseshoe crab populations that should be more accurate. But, we don't know that it actually is more accurate, do you? You just believe that it is. I do not know if this new model will show a higher or lower population of horseshoe crabs, or even if it is counting red knots, but shouldn't we wait and see if it is more accurate before we allow increased harvesting of female horseshoe crabs? Let's implement the new scientific modeling system, but wait at least a year to amend any harvesting numbers until the new assessment method is field (sea) verified.

Regardless of the assessment method used, I am strongly opposed to the taking of any female horseshoe crabs. As you are aware, the current Management Plan recognizes that horseshoe crab eggs are essential not only to the horseshoe crab population, but also to the red knots. The red knot population has plummeted in recent years due to overharvesting of horseshoe crab eggs (and probably other factors also (climate change for instance affecting the timing of the red knots getting to the Delaware Bay at the same time the crabs do.), and we cannot allow that to happen again. It is imperative that the quota of female horseshoe crab harvesting remain at zero until red knot population rebounds to 81,000 and the horseshoe crab population returns to its historic 12 million population figure.

Therefore, I recommend that there be no change to the management plan increasing the number of females harvested - it should remain at zero. I took note that Packages 1 and 2 continue that zero quota, but allow the harvesting of up to 500,000 male horseshoe crabs. Obviously of those two packages, I would recommend package 1. Packages 4 and 5 should be dismissed out of hand as being totally out of sync/inappropriate with already recognized environmental standards that are necessary to allow the horseshoe crab – and eventually the red knot- population -to increase until populations of both species are sustainable.

I thank you for reading my comments. Bill Nierstedt, 320 Hickory Avenue, Garwood, NJ, 07027 – and a property owner in Cape May, New Jersey

Sent from [Mail](#) for Windows



Virus-free www.avg.com

From: [bucktail](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Tuesday, August 23, 2022 10:25:08 AM

The HORSESHOE CRAB population has been dropping for several years and there needs to be tougher control to assure we get a population growth... The eggs are critical to migrating birds Commercial crabbers who are sucking these crabs up have several other options for crab bait available

**PLEASE PROTECT THE HORSESHOE CRAB IN DELAWARE BAY
BILL SHILLINGFORD EMAIL BUCKTAIL8@AOL.COM**

From: [william.oneill](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Harvest
Date: Sunday, September 11, 2022 2:33:16 PM

I'm joining the Audubon Society's protest to the renewed harvesting of female Horseshoe crabs. For over a decade this moratorium has been in place and has helped bring the population back but not in sufficient numbers yet. New Jersey has a big stake in eco-tourism and this will a big mistake if the Horseshoe Crab Population and thus the migratory bird population crashes. Once it does, there may not be any birds to see. It is too soon to end this moratorium.

Bill O'Neill
Ocean City, N.J.

From: [Bob Callahan](#)
To: [Comments](#)
Subject: [External] Female Horseshoe Crabs
Date: Wednesday, September 28, 2022 9:03:07 AM

Atlantic States Marie Fisheries Commission:

I respectfully submit to you that the harvest of female horseshoe crabs should not be allowed at this time.

--Female horseshoe crabs annually produce thousands of eggs that are essential food for migrating birds.

--Rampant development in coastal Delaware is detrimentally impacting spawning areas.

--The crab population is being managed at a historic low from the 1990s.

--Horseshoe crabs have existed for millions of years and yet within a few hundred years humans have endangered their existence. What does that say about humanity?

Please be on the right side of the environment and history with the revised plan. Our environment truly is a web and once one element is destroyed beyond repair other elements, such as birds, (an important tourist draw), will also implode.

Bob Callahan
38263 Comegys Court
Lewes, DE. 19958

From: [Bartlett, Bjarne](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Wednesday, September 28, 2022 1:26:42 PM

To whom it may concern:

Horseshoe crabs in the Delaware Bay area have play a vital role for shorebirds and the larger ecosystem. Overharvesting of horseshoe crabs as bait has led to a dramatic drop in crab and red knot shorebird populations. Red knots are now listed as threatened under the federal Endangered Species Act. Overharvesting of horseshoe crabs by both the bait and biomedical industries has put a severe strain on the ecological systems in this area. For over 10 years, New Jersey has tried to protect red knots by imposing a moratorium on harvesting horseshoe crabs for bait in state-controlled waters. These animals can still be harvested for their blood, which contains a chemical used by the biomedical industry.

Limulus Amebocyte Lysate (LAL) is used by pharmaceutical and medical device manufacturers to test their products for the presence of endotoxins, bacterial substances that can cause fevers and even be fatal to humans. The LAL test is an important medical product derived directly from a marine organism to benefit humans, to not do everything possible protect this organism is unthinkable short-sighted. This compound coagulates or clumps up in the presence of small amounts of bacterial toxins and is used to test for sterility of medical equipment and virtually all injectable drugs. When you get a vaccine, you know it hasn't been contaminated by any bacteria because of this compound extracted directly from horseshoe crabs. The safety of each injection, vaccination, or surgery you have received depends on the blood of horseshoe crabs.

Horseshoe crabs are critical to shorebird populations, as well as human health. They have much more important uses to use than harvesting for bait. It is certainly not worth it.

Bjarne Bartlett
6 E Essex Ave, Long Beach Island, NJ

--

Bjarne Bartlett, PhD | Postdoctoral Scholar | Oregon State University | Food Science & Technology | 3051 SW Campus Way, Corvallis, OR 97331 | (541) 737-3131 | bjarne.bartlett@oregonstate.edu

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From: hopkins@echoes.net
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Tuesday, August 23, 2022 7:01:30 PM

Hello and to whom it may concern! Hope and trust all are having a good week.

I would strongly encourage all the staff at the Atlantic States Marine Fisheries Commission (ASMFC) to closely review all data surrounding the harvesting of female horseshoe crabs and dependent migrating birds that feed on their eggs. I'm sure you are doing this already....but there appears to be many conflicting opinions when one looks at different websites.

I would strongly urge you to err on the side of caution.

The horseshoe crab in the medical world is a lifesaver for all things human. The bird world seems as dependent.

I would encourage you to be the best stewards possible.

Thank you for reading this and have a good week,
Bob Hopkins
Windsor, NY

From: [Bruce Fleming](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Thursday, September 29, 2022 10:05:08 AM

Horseshoe Crab habitat for reproduction along the Delaware coast will certainly continue to come in conflict with human development. Help keep measures that will keep this ancient creature in equilibrium with human activities.

From: [Carly Muletz Wolz](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Wednesday, September 14, 2022 10:41:30 PM

Several indicators show both horseshoe crab populations themselves and the population of a Federally threatened shorebird, the red knot, that depends on horseshoe crabs, are well below recovery thresholds. Allowing the killing of female horseshoe crabs at this critical moment all but assures that the population of shorebirds like the red knot will never recover.

From: [Boris Kerzner](#)
To: [Comments](#)
Subject: [External] Please Abandon Attempt to Lift Moratorium on Taking Female Horseshoe Crabs for Fish Bait
Date: Saturday, September 3, 2022 10:26:27 PM

To whom it may concern:

It recently came to my attention that the ASMFC is planning to lift its moratorium on the harvesting of female horseshoe crabs. This will negatively impact the population of the horseshoe crabs for years to come and will mean less food for the declining population of red knots when they migrate from Tierra Del Fuego to the Arctic Circle, stopping off in the Delaware Bay to eat horseshoe crabs. Please do not lift this moratorium! With the biodiversity crisis being what it is, we should be using as few species as possible and letting them just live. I am sending this comment as part of the public comment period ending Sep 30th.

Thanks,

Boris Kerzner (zip 19027)

From: [Carol S. Stephens](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Wednesday, September 28, 2022 2:32:31 PM

It does not seem appropriate to harvest female horseshoe crabs. The population of horseshoe crabs must be significantly larger than the present level so the food source for red knots and other migratory shorebirds is not negatively impacted. Do not be wreckless by harvesting female horseshoe crabs.

Thank you,
Carol Stephens
23738 Herring Reach Ct
Lewes, DE 19958

From: [Carole Griffiths](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Monday, September 19, 2022 3:14:48 PM

Dr. Carole S. Griffiths
Ocean View, New Jersey
Research Associate, American Museum of Natural History

I join the American Littoral Society and NJ Audubon in opposing the Atlantic States Marine Fisheries Commission's (ASMFC) proposal to increase the harvest of horseshoe crabs, including a harvest of females for the first time in over a decade. I support Option A - NO Action – reverting to provisions under Addendum VI.

Where is the data that shows that an increase is justified. Egg density data is the most reliable indicator of the horseshoe crab population, and the most reliable index of value for red knots and other shorebirds. Yet ASMFC has never included these surveys in its modeling. ASMFC also does not include field survey data for Red Knots, and these show that Red Knot populations are at historic lows. In the 1990s, more than 90,000 could be found along Delaware Bay. This year, only 12,000 were counted, and in 2021, the number was estimated at an all-time low of 6,800.

Currently, there is no female crab harvest until female abundance reaches 11.2 million crabs or until the Delaware Bay total Red Knot stopover population reaches 81,900 birds. The proposed revision would allow the resumption of the female harvest, even though, as indicated above, neither the Red Knot nor female horseshoe crabs of Delaware Bay are close to satisfying either metric and the models used by ASMFC do not include the most reliable data for estimating population size of either the horseshoe crabs or red knots.

The joint collapse of Red Knots and horseshoe crabs is not inevitable. But this proposal propels them closer to that grim reality and the resolution effect of this action will have a significant impact on the federally threatened Red Knot and other shorebirds that depend on horseshoe crab eggs during spring migration stopovers in Delaware Bay, putting them at risk of further population declines. This will also have a significant impact on the tourism industry – thousands of birders visit Cape May in the spring to see the shorebird migration and they spend millions of dollars locally.

Thank you!

Dr. Carole S. Griffiths

From: [Carrie O'Brien](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Sunday, August 21, 2022 10:22:31 AM

Please do not approve the proposed framework revision for harvesting Delaware Bay horseshoe crabs. Under the proposed management revision, 175,000 to 190,000 female horseshoe crabs could be harvested from the Delaware Bay by commercial fishermen as soon as 2023, according to some experts.

Each year since 2013, the ASMFC has selected the same allowable harvest totals for Delaware Bay horseshoe crabs, which is 500,000 males and zero females. It was agreed that the prohibition on harvesting female horseshoe crabs would not be lifted until the Delaware Bay region hosts at least 81,900 red knot shorebirds or 11.2 million female horseshoe crabs. Neither of these scenarios has occurred yet and making these changes now would put a severe strain on horseshoe crabs, red knots, and other shorebirds. In fact, the Virginia Tech trawl survey, which is the only horseshoe crab-specific survey that has been historically reliable, continues to indicate that female horseshoe crabs are in trouble. Similarly, red knot counts have been at historic lows in recent years. The average red knot count at Tierra del Fuego for 2018-2020 declined more than 75 percent from average counts in the 1980s and 2000, and only 6,800 red knots were counted in 2021.

From: [Christi-June Chiu](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Wednesday, September 28, 2022 4:25:54 PM

Atlantic States Marine Fisheries Commission:

As a Delaware Master Naturalist, I feel it is my duty to implore you to reconsider the horseshoe crab harvest update. Allowing the harvest of female horseshoe crabs at this time would be detrimental to the ecosystem.

Horseshoe crabs are a keystone species and are depended upon by many other species in the ecosystem. Several types of shorebirds feast on the fatty and nutrient rich horseshoe crab eggs such as the ruddy turnstone (*Arenaria interpres*) and sanderling (*Calidris alba*) but most notably the threatened red knot (*Calidris canutus rufa*) which use Delaware Bay as a refueling stopover in their approximately 9,000 mile migration from Tierra del Fuego to the Arctic for breeding. Because crab populations have dropped, thousands of migrating loggerhead sea turtles (*Caretta caretta*) have turned to raiding fish nets and crab traps for food.

The population of horseshoe crabs has declined by 90% over the last 15 years, mostly due to overharvesting and habitat degradation. I have personally been a part of the horseshoe crab surveys done annually here at slaughter beach and the data developed to track our crab population does not show a significant increase in crab numbers. This update in the management plan could result in an underestimation of the number of crabs that our coast can support at the expense of the fish and bird species that rely on them for food.

A better alternative to harvesting female crabs is to harvest more male crabs. Because male-to-female ratios are high in our area, harvesting more males would not affect reproduction rates. Allowing females to continue growing and reproducing is the best bet to protect estuary ecosystems recovering from overharvest and facing the impacts of rapid climate change.

Thank you for reading my concerns and I trust you will choose to side with what is best for the environment.

Respectfully,

Christi-June Chiu

17065 Spruce Road

Ellendale, DE 19941

From: [Christina Hopkins](#)
To: [Comments](#)
Subject: [External] Horseshoe crab harvest
Date: Sunday, September 11, 2022 1:57:24 PM

Hello, I stand with New Jersey Audubon society for limiting the harvest of horseshoe crabs, both male and female. These precious creatures need as much protection as possible. Thank you for listening to my views. Christina Hopkins

From: [Walters, Christopher K.](#)
To: [Comments](#)
Subject: [External] Horseshoe crab harvest rules
Date: Sunday, September 11, 2022 11:24:05 AM

I oppose the proposed change in horseshoe crab harvesting rules. The crab populations and Red Knot numbers in Delaware Bay are terribly depressed —allowing renewed harvesting of female horseshoe crabs is an awful idea.

This proposal is a threat to the unique natural environment of Delaware Bay and must be shelved.

Chris Walters

* * *

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From: [Christopher Anderson](#)
To: [Comments](#)
Subject: [External] Please do not adjust Management Plan
Date: Tuesday, August 23, 2022 8:52:06 PM

Hello,

Please do not adjust the Management Plan for the Horseshoe Harvest in the Delaware Bay. The proposed changes would imperil horseshoe crabs and as a result lead to grave risks to the Red Knot population. Red Knots are already at risk and this change would exacerbate those risks. The existing plan requirements have not been met and therefore the proposed changes are premature. Please do not adopt these proposed changes.

Respectfully,

Chris Anderson
1215 Portner Road
Alexandria VA 22314

From: [Chris Chech](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Saturday, September 3, 2022 11:12:51 PM

Atlantic States Marine Fisheries Commission

September 3, 2022

Dear Atlantic States Marine Fisheries Commission:

I am writing to you today to ask you to continue your policy of not allowing harvesting of female horseshoe crabs.

Population counts for horseshoe crabs and the red knot birds which rely on the horseshoe crab eggs for food are still dangerously low.

Please protect the future of these beautiful birds by maintaining the protections currently in place for female horseshoe crabs.

Sincerely,

Christopher Chech

Sent from my iPhone

From: [Chris Lish](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII -- protect the red knot and its food supply by rejecting this dangerous proposal
Date: Thursday, September 29, 2022 9:35:34 AM

Thursday, September 29, 2022

Caitlin Starks
Atlantic States Marine Fisheries Commission
1050 N. Highland St. Suite 200A-N
Arlington, VA 22201

Subject: Horseshoe Crab Draft Addendum VIII -- protect the red knot and its food supply by rejecting this dangerous proposal

Dear Atlantic States Marine Fisheries Commission,

I am writing to urge Atlantic States Marine Fisheries Commission (ASMFC) to protect red knot shorebirds by rejecting Addendum VIII to the fishery management plan for horseshoe crabs.

“As we peer into society’s future, we—you and I, and our government—must avoid the impulse to live only for today, plundering for our own ease and convenience the precious resources of tomorrow. We cannot mortgage the material assets of our grandchildren without risking the loss also of their political and spiritual heritage. We want democracy to survive for all generations to come, not to become the insolvent phantom of tomorrow.”

-- Dwight D. Eisenhower

Delaware Bay is a linchpin for one of the most epic migrations on Earth. Every year, red knots fly from as far south as Tierra del Fuego to their breeding grounds in the Arctic Circle. They reach Delaware Bay just as horseshoe crabs emerge from the water to lay eggs upon the beach. These eggs provide crucial nourishment for red knots to complete their journey and breed successfully.

In recent decades, overfishing has decimated the horseshoe crab population at Delaware Bay, leading to a sharp decrease in red knots, which are now listed as “threatened” under the Endangered Species Act. Under the current management program, horseshoe crabs have not recovered, and red knots have continued to decline. Rather than taking steps to reverse this trend, Addendum VIII would open the door to resuming the harvest of female horseshoe crabs, further imperiling red knots and potentially violating the Endangered Species Act.

Red knots face an uncertain future and require a precautionary management approach. ASMFC should reject Addendum VIII, which would put red knots at even greater risk.

“A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise.”

-- Aldo Leopold

Thank you for your consideration of my comments. Please do NOT add my name to your mailing list. I will learn about future developments on this issue from other sources.

Sincerely,
Christopher Lish
San Rafael, CA

From: [Christine Reel Brander](#)
To: [Comments](#)
Subject: [External] Horseshoe crabs
Date: Thursday, September 29, 2022 9:11:16 PM

Please do not raise the quota of the amount of horseshoe crabs killed for bait and do not allow females to be included in the harvest. Horseshoe crabs are vital to their ecosystems and shorebirds and migrating birds are particularly dependent on their eggs for food. Pressure from the biomedical industry and habitat loss have caused populations in the US to decline. Sound management strategies would help prevent further decline but the proposed changes will deplete this valuable species.

Thank you for your consideration,
Christine Reel Brander



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From: [Clare Liebhardt](#)
To: [Comments: Caitlin Starks](#)
Subject: [External] HCFMP***attention***
Date: Thursday, September 29, 2022 6:09:45 PM

As a supporter of OceanElders
I submit my request to stop the draft addendum from raising Horseshoe crab Fishery
Management Plan -catch count.

AND to not ever allow the harvest collecting to include female horseshoe crabs..NEVER!
EVER!

Clare Liebhardt, California

From: [Connie Yaqub](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Sunday, September 11, 2022 9:28:22 PM

Now is not the time to step back from protecting horseshoe crabs, red knots, and other migratory birds! Please do not make this disastrous change by lifting restrictions on harvesting. Female horseshoe crabs and the federally threatened red knots need to be protected.

The birds and the crabs draw ecotourists from around the world, bringing an estimated \$35-50 million in annual revenue to New Jersey. **I was one of those ecotourists!** Horseshoe crab eggs and larvae are also a seasonal food item of invertebrates and finfish, while the crabs themselves are an important food source for loggerhead turtles.

I understand that the crabs are used by the biomedical industry. **I drove from PA to attend a lecture and a field trip to hopefully spot the red knot. I spent money there because of the crabs and red knots.** I think I recall that other sources are being found and created to replace the blue blood for biomedical uses. Resources should be provided to those seeking alternatives.

I also understand that the crabs are used for bait for commercial American eel and conch fisheries. If you need to cut something, cut this use. I don't want to see fishermen or canneries lose income, but those people can find other jobs. Red knots and other migratory birds cannot survive without the crabs.

It was agreed by ASMFC that the prohibition on harvesting female horseshoe crabs would not be lifted until the Delaware Bay region hosts at least 81,900 Red Knots or 11.2 million female horseshoe crabs.

Neither of these scenarios has occurred. The average Red Knot count at Tierra del Fuego for 2018-2020 declined more than 75 percent from average counts in the 1980s and 2000. In 2021, only 6,800 Red Knots were counted, which is by far the lowest count since surveys began.

Please do the right thing. Female horseshoe crabs and the federally threatened red knots need to be protected.

Thank you.

Connie Yaqub, Ph.D.

From: [Conor Ofsthun](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Monday, August 29, 2022 10:31:14 AM

Please work towards maintaining healthy populations of horseshoe crab to sustain the Delaware Bay ecosystem.

Thank you,
Conor

--

Conor Ofsthun

From: [constance.kane](#)
To: [Comments: constance.kane](#)
Subject: [External] Horseshoe crabs
Date: Friday, September 30, 2022 6:22:23 AM

Please protect these prehistoric creatures. We need to continue all we can do to see that their lives are protected along with their habitat. Every year my son and I find a sense of responsibility and Joy in flipping these creatures to ensure their safe return to the ocean.

Constance Kane and Grant Garrett

From: [D.EK](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Wednesday, August 17, 2022 10:32:24 AM

The following is a copy of an email I sent on August 7, 2022. I received an email back stating it was not within the public comment period. I am resending it hoping my comment will be read.

I would not like to see the harvesting of egg laying female horseshoe crabs by commercial fishermen. The new model which is based on empirical data collected from Delaware Bay is a better estimate than the models previously used. Since the data are not derived from purpose design surveys to count horseshoe crabs the accuracy of the surveys is in question. Also why isn't egg density incorporated into the model? I don't feel even the possibility of jeopardizing the Red Knot survival is worth it.

From: [Corey Schade](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Wednesday, August 24, 2022 10:29:14 AM

Dear Sir or Madam:

I am writing to express my opposition to the ASMFC proposal that would endanger Delaware Bay horseshoe crabs and the migratory shorebirds (like the Red Knot) which depend on them.

Overharvesting of horseshoe crabs by the bait and biomedical industries has already put a severe strain on the ecological connection between horseshoe crabs and shorebirds like the threatened Red Knot. Although the Red Knot population is perilously low, the ASMFC has proposed allowing the harvest of female horseshoe crabs, whose eggs provide the food that fuels the final leg of the birds' journey to Arctic nesting grounds.

Please rethink about the importance of horseshoe crabs to our ecology. Please think of future generations. Please withdraw this disastrous proposal.

Thank you for your time and attention.

Respectfully,

Corey Schade

From: [Cynthia Pilot](#)
To: [Comments](#)
Subject: [External] Horseshoe crabs
Date: Sunday, September 11, 2022 6:22:08 PM

I feel that increasing horseshoe crab harvest at this time is premature. I think you need to curtail the harvest of menhaden and horseshoe crabs until the birds and fish that rely on them are back to historic or at least healthy populations--
lp12321

From: jpchurch1@juno.com
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Tuesday, August 23, 2022 2:45:18 PM

I am opposed to any harvest of female horseshoe crabs. Red Knots and other shorebirds are dependent on the eggs for their survival as they migrate to the Arctic. The crash of shorebird populations is linked to overharvesting of female horseshoe crabs in the past. Until the populations of shorebirds recover there should be no female crab harvest. Dana Eglinton 938 Jacksonville Mt Holly Rd Bordentown, NJ 08505

From: [David Burch](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Tuesday, September 6, 2022 11:45:38 AM

I urge the Commission to respect the 2009 Adaptive Resource Model (ARM) Framework and protect the populations of horseshoe crabs and the threatened red knot. The Commission should reject proposed changes to regulations for horseshoe harvesting that would allow harvesting of female horseshoe crabs and thus compromise the essential food supply for the migratory red knot.

Horseshoe crabs play an essential role in Delaware Bay ecology, so protecting the horseshoe crab population should take precedence over any competing uses.

Thank you.

David Burch
Ocean Gate, NJ

bikeburch@hotmail.com

From: [Daniel Daughtry-Weiss](#)
To: [Comments](#)
Subject: [External] Proposed horseshoe crab harvest changes
Date: Tuesday, August 23, 2022 9:18:20 AM

As a resident of Maryland I urge the Commission to:

- Provide the modelling and analysis which justifies the expansion of the harvest of female horseshoe crabs for the public to review; and that the Commission
- Ensure that the original safeguards in their harvest policies, which prohibit female horseshoe crabs from being harvested until Red Knot numbers recover, are included in any new policies.

These are common-sense policies that support key objectives of harvest policy.

Daniel Daughtry-Weiss
2244 Belleview Ave
Cheverly, md 20785
301-437-9397

--

Daniel Daughtry-Weiss

From: [DAVID.TAGGART](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Tuesday, August 23, 2022 11:36:11 AM

Please do not allow harvesting of endangered horseshoe crabs. Thank you.

Sent from my iPhone

From: [Caitlin Starks](#)
To: [Comments](#)
Subject: FW: [External] Horseshoe Crabs
Date: Friday, September 30, 2022 9:17:32 AM

-----Original Message-----

From: KATHY AND DAVID DEVINE <alohapuako@aol.com>
Sent: Thursday, September 29, 2022 7:08 PM
To: Caitlin Starks <cstarks@asmfc.org>
Subject: [External] Horseshoe Crabs

Aloha Caitlin Starks, I am writing to express my concern for the draft addendum to the Horseshoe Crab Fishery Management Plan. I'm asking not to pass the addendum. I believe that more protective measures should be taken for the horseshoe crabs. Thank you. Aloha, David Devine

Sent from my iPhone

From: [Dawn Zelinski](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Tuesday, August 23, 2022 10:37:21 AM

Dear Ms. Starks,

I am writing in opposition to the proposed changes to horseshoe crab harvesting.

Overharvesting of horseshoe crabs by the bait and biomedical industries has put a severe strain on the ecological connection between horseshoe crabs and shorebirds like the threatened Red Knot. Although the Red Knot population is perilously low, the ASMFC has proposed allowing the harvest of female horseshoe crabs, whose eggs provide the food that fuels the final leg of the birds' journey to Arctic nesting grounds.

Apart from its effects on bird populations, horseshoe crabs have an inherent right to their lives and should be left undisturbed. They do not exist for us. They exist for themselves.

Sincerely,
Dawn Zelinski
Middletown, NJ

From: bearles@embarqmail.com
To: [Comments](#)
Subject: [External] HORSESHOE CRAB DRAFT ADDENDUM VIII
Date: Wednesday, September 28, 2022 10:39:17 PM

To the Atlantic States Marine Fisheries Commissioners

Thank you for accepting comments on the current female horseshoe crab harvest proposal. We appreciate ASMFC's role in balancing decisions on fisheries. We respectfully request ASMFC to NOT APPROVE the proposal that would lift the current moratorium and allow the killing of female horseshoe crabs. Our house is one block from the Bay beach and we have spent days on this beach for over 25 years. We want to emphasize that our personal observations are that the quantity of horseshoe crabs has steadily declined for years. The same for the Red Knots. It does not make sense to now allow harvesting of female crabs. The harvest of the male crabs should be sufficient, and if not, other sources of bait should be used. Please DO NOT END the moratorium on female crabs. Thank you for considering our opinions.

Debbie and Les Hamilton, North Cap May

From: [Dee O'Reilly](#)
To: [Comments](#)
Subject: [External] horseshoe crabs
Date: Monday, September 12, 2022 1:20:05 PM

Please do not change the protections put in place for the horseshoe crab. As a 66 year old life-long NJ resident I can remember a time when the horseshoe crabs were all over the beach..... sadly now I can't remember the last time I saw one. Please DO NOT increase the harvesting and DO NOT allow females to be harvested.

Thank you,
Dee O'Reilly
Cranford, NJ

From: [info](#)
To: [Comments](#)
Subject: FW: [External] Horseshoe crab Draft addendum VIII
Date: Monday, September 19, 2022 12:52:08 PM

From: Dawn S <dwnszeker@yahoo.com>
Sent: Monday, September 12, 2022 7:05 PM
To: info <info@asmfc.org>
Subject: [External] Horseshoe crab Draft addendum VIII

Recent declines in the horseshoe crab population have triggered similar and more drastic declines in shorebird populations. Even though immediate action may not be needed to save the Atlantic horseshoe crab from extinction, immediate protection of horseshoe crabs is necessary to protect the species that rely on them.

Please do NOT allow more harvesting of horseshoe crabs!!! Why would You choose to do this knowing their numbers are declining? What will it take to allow our marine life to live peacefully? Please reconsider this change. I am a protector of the ocean and can't believe you would consider this. Please reply with why your doing this. Thank you!

Dawn Szeker

dwnszeker@yahoo.com

[Sent from Yahoo Mail on Android](#)

From: [Donna Flesher](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Thursday, September 1, 2022 9:02:34 PM

Dear ASMFC,

I am against lifting the moratorium on harvesting horseshoe crabs for bait. Please do not lift it. They are precious to the natural chain of life. It is all our responsibility to ensure the protection of all species and to be good stewards of our wonderful Earth.

Sincerely,
Donna Flesher
dmdf123@gmail.com

40 Plennert Road
Flemington, NJ 08822
United States

From: [Donna Hoyt](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Friday, September 30, 2022 2:52:41 PM

Please do not allow the harvest of female horseshoe crabs at this time.

Horseshoe Crabs are being managed at a historic low from the 1990's.

Red Knots and other migrating birds dependent on horseshoe crab eggs have recently experienced drastic declines in numbers.

Extreme coastal development is decreasing spawning areas as is climate change.

Experiencing this yearly spring migration of birds feeding on horseshoe crab eggs is an awesome sight enjoyed by thousands of birders and tourists, bringing much money to Delaware.

If some limited harvesting of horseshoe crabs is to be allowed, please restrict the harvest to male horseshoe crabs .

Donna Hoyt
311 W 4th Street
Lewes, DE 19958

Sent from my iPad

From: [Diane Walker](#)
To: [Comments](#)
Subject: [External] Please Stop or drastically limit the harvesting of Horseshoe crabs for bait, especially female crabs
Date: Sunday, September 11, 2022 11:38:17 AM

I agree with the Audubon Society.

We need to increase the population of horseshoe crabs and female crabs to ensure the red knot migratory population will continue to stop at the Delaware Bay in the future and consume some of their eggs.

Please limit the harvesting of these horseshoe crabs for bait, and create high penalties for those who ignore and violate this action.

Thank you!

Diane V. Walker

dianevalerie@comcast.net

Sent from my iPhone

From: [Diane Karluk](#)
To: [Comments](#)
Subject: [External] re: NO to Horseshoe Crab Draft Addendum VIII
Date: Monday, September 12, 2022 5:40:14 AM

DO NOT PASS/ACCEPT the Atlantic States Marine Fisheries Commission's (ASMFC) proposal to increase the harvest of horseshoe crabs, including a harvest of females for the first time in over a decade. This will adversely impact Red Knot and other shorebirds that depend on horseshoe crab eggs during spring migration stopovers in Delaware Bay, putting them at risk of further population declines.

Sincerely,

Diane Karluk

19 Rocktown Hill Rd, Ringoes, NJ 08551

From: [Donna Caputo](#)
To: [Comments](#)
Cc: [Donna](#); [SCOTT YAEDE](#); [Scott Mary Jane Yaede](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Monday, August 29, 2022 1:38:59 PM

Dear ASMFC,

Please don't change the current policy to protect the prehistoric and important survival of the horseshoe crabs. It was agreed that the prohibition on harvesting female horseshoe crabs would not be lifted until the Delaware Bay region hosts at least 81,900 Red Knots or 11.2 million female horseshoe crabs.

Neither of these scenarios has occurred, yet the ASMFC proposed changes would result in lifting the prohibition on harvesting female horseshoe crabs, further imperiling the food supply for the remaining Red Knots.

This is coming at a time when Red Knot population is far from stable. The average Red Knot count at Tierra del Fuego for 2018-2020 declined more than 75 percent from average counts in the 1980s and 2000. In 2021, only 6,800 Red Knots were counted, which is by far the lowest count since surveys began.

Thank you for doing the right thing,
Donna Y. Caputo
Cape May NJ

Sent from my iPad

From: mailagent@thesoftedge.com on behalf of dd66rsb@cox.net
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Thursday, September 29, 2022 1:20:39 PM

Dear Ms. Starks:

I strongly oppose adopting the 2021 ARM Framework revisions under Draft Addendum VIII as a standard for setting horseshoe crab bait harvest specifications. The value of migratory birds and the need to manage these resources across jurisdictions has been recognized in the United States for more than a hundred years. I am very concerned that adopting the changes proposed in the 2021 ARM Framework revision will not only setback decades of conservation efforts to protect migrating shorebirds, but, that this change could also cause irreparable damage to shorebird and horseshoe crab populations.

The underlying data supporting the new draft addendum to the plan has still not been released to the public, so conservation groups and concerned citizens have no way to understand the science on which the new proposal is based. When will the data supporting this plan be released?

Making matters worse, ASMFC also does not include the most recent field survey data for red knots, which suggest historically low numbers of red knot feeding through the spring season in Delaware Bay. In the 1990s, more than 90,000 could be found along Delaware Bay during aerial surveys. This year, only 12,000 were counted, and in 2021, the number was estimated at an all-time low of 6,800. This doesn't necessarily mean the population has crashed, but could indicate that red knots are bypassing the Delaware Bay stopover altogether in search of life-sustaining food sources elsewhere. This makes their migratory journey all the more perilous, which could further impact the population recovery. Given this uncertainty in the status of red knot in Delaware Bay, extreme caution should be taken in making any management decisions that could negatively affect them.

9/29/2022--I cannot believe we allow harvesting horseshoes and other sea creatures for fertilizer and pet food. That should be stopped. Birds and other wild life are disappearing at an alarming rate--please do all you can to protect these ancient sea dwellers. We humans do not want to be the only creatures left on the planet. Thank you. Donnie Powell

I strongly oppose the use of the 2021 ARM Framework as the basis for setting horseshoe crab harvest regulations. I urge the ASMFC to make no change to the regulations.

Sincerely,

Donnie Powell
1556 Sweetwater Drive
Warner Robins , GA 31088

From: [Ed Casson](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Thursday, September 1, 2022 11:18:32 AM

I am writing to urge you to keep your current policy protections for female horseshoe crabs.

Edward Casson

ecasson@gmail.com

From: [Doris Stoner](#)
To: [Comments](#)
Subject: [External] Increasing the harvest of horseshoe crabs.
Date: Sunday, September 11, 2022 4:50:57 PM

I am joining NJ Audubon in opposition to the proposal to increase the harvesting of horseshoe crabs.
This is appalling.

Doris M .Stoner

From: [EILEEN FERRER](#)
To: [Comments](#)
Subject: [External] *Horseshoe Crab Draft Addendum VIII
Date: Friday, September 2, 2022 5:19:16 AM

It is critical that we stop the harvest of horseshoe crabs in New Jersey until the Red Knot populations rebound. Please! It is our responsibility to save these birds and the scientific evidence is clear that horseshoe crab eggs are the answer.

Eileen Ferrer
Mendham, NJ

Sent from [Mail](#) for Windows

From: [Beth B](#)
To: [Comments](#)
Subject: [External] ASMFC's Proposal
Date: Saturday, September 17, 2022 11:37:01 AM

We join NJ Audubon in opposing the Atlantic States Marine Fisheries Commission's proposal to increase the harvest of horseshoe crabs, including the harvesting of females for the first time in over a decade. This action WILL SIGNIFICANTLY impact the federally threatened Red Knot and other shorebirds that depend on horseshoe crab eggs during spring migration stopovers in Delaware Bay by putting them AT RISK of further population declines.

To ignore the field survey data that supports the evidence is unethical.

Regards,
Elizabeth Hoke
Julia Chrisman
Philip and Elizabeth McNamara
Robert and Sisley Daniels
David and Lois Brown

From: [Beth Law](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Tuesday, September 27, 2022 9:30:49 PM

Please do not allow the harvest of female horseshoe crabs!!! Their eggs are critical for migrating shorebirds, and the horseshoe crab population is nowhere near large enough to support their harvest. Please protect our horseshoe crabs and birds!

Thank you,
Elizabeth Law

Sent from [Mail](#) for Windows

From: [Eli Dober](#)
To: [Comments](#)
Subject: [External] Horseshoecrabs
Date: Monday, August 22, 2022 3:00:35 PM

Only when humanity's circle of compassion is extended to all living things will there be peace.-Albert Schweitzer

E.Dober

From: [Eleanor Gruber](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Saturday, September 17, 2022 7:58:57 AM

Thank you for the opportunity to comment.

The League of Women Voters is not an environmental organization; we are a public interest organization which believes in the active and informed participation by citizens in Government. In this case, we strenuously object to your Draft Addendum VIII with an increase in horseshoe crab fishing limits.

Our primary objection is the lack of transparency of the modeling data you present. There is no ability for others to examine the basis for the expanded fishing.

Horseshoe Crabs are a keystone species. To grind them up to use for bait not only threatens the migratory birds, but also all marine life that depends on these eggs for food. To increase limits without sharing data flies in the face of scientific examination.

The recovery of the red knot and palminated plovers is nowhere near its higher levels. Statements made that this is a result of climate change does not account for the precipitous drop in both red knot and palminated plovers over the years. There were fewer eggs, thus less food. We are seeing these numbers start to recover, mostly due to a moratorium in NJ and current fishing limits along the Atlantic. But the numbers are still dangerously low. Raising these limits will impede any progress made. .

During the hearing it was stated that demand for both eel and whelk have diminished, but that I did not see that in your presentation,

Before you make your final decision, and in the interest of transparency, we urge you to share the model so that it can be analyzed in full. There can be no harm in sharing the data so that it can be fully examined.

Thank you,
Ellie Gruber
co-chair League of Women Voters or New Jersey Natural Resources Committee

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Please consider the environment - do you really need to print this email?

From: [Ellie Pugh](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Saturday, September 17, 2022 1:45:39 PM

Hello,

I strongly oppose the Atlantic States Marine Fisheries Commission's (ASMFC) plan to change its Horseshoe Crab Fishery Management Plan, a move that would raise quotas on the killing of horseshoe crabs for use as bait by potentially reopening the harvest to include female horseshoe crabs. As it stands, there is no female crab harvest until female abundance reaches 11.2 million crabs or until the Delaware Bay total red knot stopover population reaches 81,900 birds, a metric that neither population is near to meeting. Furthermore, based on data obtained through fieldwork, The Horseshoe Crab population, in general, has still yet to recover from its collapse in the 1990s.

As you may know, Red Knot birds are very dependent on the eggs lain by Horseshoe Crabs. It is critical that we do not raise the quotas not only to protect the Horseshoe Crab population but also the population of Red Knots along the coast. Just last year, we saw the number of Red Knot along the Delaware bay drop to an all-time low of 6,800 (a number that was 90,000 in the 1990s). Stopping the joint collapse of these two populations is very doable, but plans such as this changing of the Management Plan move this grim possibility closer and closer to reality.

Please consider this before this change is passed,
Ellie

From: [Emelia Oleson](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Harvest
Date: Sunday, September 11, 2022 3:14:33 PM

I stand with NJ Audubon in opposing the Atlantic States Marine Fisheries Commission (ASMFC) proposal to increase the horseshoe crab harvest, including the taking of females for the first time in over a decade. This action significantly and negatively impacts the Federally-threatened Red Knot and other shorebirds that depend on the horseshoe crab eggs to fuel their spring migration. For millennia, these birds have used the Delaware Bay ecosystem as a stopover for resting and refueling on their migration north to their breeding grounds in the Arctic. This increase in harvesting of the horseshoe crabs, especially females, will put the Red Knot and other shorebird populations at risk and will result in further population declines of both the birds and the horseshoe crab.

From: [eric baratta](#)
To: [Comments](#)
Subject: [External] Comments for "Horseshoe Crab Draft Addendum VIII"
Date: Friday, September 9, 2022 11:35:32 AM

Dear ASMFC staff,

I was unable to attend webinar hearings related to the proposed changes to ARM Framework for horseshoe crab populations and commercial use or harvest of this species and would like to submit the following comments for consideration by your organization and commission.

I have been volunteering with the Return the Favor NJ program for several years and have kept abreast of developments related to this potential policy change and recent research done in the field related to horseshoe crabs and wildlife such as, but not limited to, the Red Knot migratory bird.

Based on the clear research done in the field by multiple scientific organizations and communities, and the enigmatic process behind the assessment of current horseshoe crab population numbers which are being referenced by the proposed policy change, I am requesting that no change be made to the current prohibition of the taking of female horseshoe crabs for any commercial fishing use. It is a shocking proposition to permit taking of female horseshoe crabs for commercial fishing bait given the decline of migratory birds related to this keystone species, and the already significant environmental challenges faced by horseshoe crabs and migratory birds through climate change, environmental degradation of breeding and spawning areas, other man-made challenges through land use, and pollution. It is impossible to imagine that the reduction of already low numbers of female horseshoe crabs will not result in the finality of the extinction of the Red Knot in the near future, with likely impacts to other threatened and endangered migratory birds, simply for the short-term benefit of the commercial fishing industry. This is myopic policy based on the greed of a few which will likely lead to permanent consequences for wildlife on the East Coast shoreline.

In addition to denial of this policy change, I would ask that all data that is being used in the proposal of this change be made public in its entirety, and that any decision based on this data be delayed until the non-commercial, scientific community and general public has had ample time to review and contest data where applicable.

With respect and sincerity,

Eric Baratta
26 Park Avenue
Beverly, NJ 08010
ericbaratta@hotmail.com

From: [erin.martin](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Friday, September 30, 2022 4:50:14 PM

Dear Sir or Madam:

I strongly oppose the proposed addendum to ASMFC's fisheries management plan allowing for the taking of female horseshoe crabs for fish bait.

As noted in the August 4 National Geographic article *Horseshoe crab blood saves lives*. ***Can we protect these animals from ourselves?***, the full repercussions of crab harvesting are **still** not understood.

Industry self-reporting is a dubious metric for management purposes, seldom accurate and never objective in protecting the interests of any other entity than the industry itself. I know this well from my professional experience working with global companies on social responsibility programs.

Simply put, the number of horseshoe crabs killed each year by humans is not known.

What is known is that populations of birds that rely on horseshoe crab eggs are sharply declining. That metric is irrefutable.

ASMFC cannot make decisions without reliable data. To trust the reporting of for-profit entities over the information provided by bird and conservation groups is a gamble in the wrong direction.

I urge you to reject the addendum on the basis that the evidence supporting an increase in catch is uncertain.

Thank you for your kind attention and thorough consideration.

Best regards,

Erin Martin

503 Mallow Road

Villas, NJ 08251

Erin Martin (she/her)
+1 646 552 9566

From: [Eva Pennock](#)
To: [Comments](#)
Subject: [External] Proposal
Date: Sunday, September 11, 2022 12:20:44 PM

In the 1990s and 1980s I enjoyed going to the beaches at Pierce's Point, Cook's Beach and stood at a respective distance and marveled at the abundance of various birds and the horseshoe crabs. They were a sign of spring as well as the red wing blackbird. It was nature in action.

When I moved to Hawaii and taught at the Maui Ocean Center and volunteered at the Pacific Whale Center, I wore a horseshoe crab on my blouse. Children, as well as adults, were fascinated and intrigued by this foreign sea creature and the benefits accrued to humans by this animal. Also, they were saddened by the decimation of them and the decrease in birds that humans inflicted on them.

Upon return to the East Coast, my husband and I ventured to the coast. He being a native of Brigantine and a marine ecologist noticed immediately the decline in the species.

Now I have read about your proposed changes that will deepen the loss of these animals.

You are succumbing to big business and little business. Yet you still want us to pay taxes and support your endeavours. Question: Will they be around for your grandchildren and great grandchildren to enjoy or will they be shown pictorially?

Please do not enact this proposal.

Sincerely,

Eva Pennock

From: [Evelyn Yaari](#)
To: [Comments](#)
Subject: [External] Re: Thank You For Your Input Regarding Draft Addendum VIII
Date: Friday, September 2, 2022 2:09:41 PM

Thank you.

In plain English, WHY would responsible people facilitate additional destruction of our natural world? There is no excuse for doing so. None.

**Kind regards,
Evelyn Yaari**

On Fri, Sep 2, 2022 at 11:08 AM Comments <comments@asmfc.org> wrote:

Thank you for providing input on Draft Addendum VIII to the Interstate Fishery Management Plan for Horseshoe Crab.

Your comments will be shared with the Horseshoe Crab Management Board for consideration at the next Board meeting, which will likely occur this Fall.

Upon considering public input, the Board will select final management measures and consider final approval of Addendum VIII.

[Caitlin Starks \(she/her\)](#) | Senior Fishery Management Plan Coordinator

Atlantic States Marine Fisheries Commission
1050 N. Highland Street, Suite 200 A-N
Arlington, VA 22201
Phone: 703.842.0740 | Fax: 703.842.0741
cstarks@asmfc.org | www.asmfc.org

From: [Gail Howarth](#)
To: [Comments](#); [Lisa Ferguson](#); [Laura Chamberlin](#); [Caitlin Starks](#)
Subject: [External] Addendum VIII Horseshoe Crab Management
Date: Tuesday, September 27, 2022 11:45:21 AM

Dear Sir/Madam:

I write on behalf of the Horseshoe Crabs, the migrating birds, and the Delaware Bay and Beaches, my fellow RTF Volunteers and Leaders and the generations to come.

I have been fortunate to summer at Reeds Beach NJ for the last 67 years and have flipped the Horseshoe Crabs for that amount of time. I have seen them when they were plentiful and I have also seen them hauled away, alive, in tractor trailers for bait and fertilizer, which was horrifying. Thankfully, ReTURN the Favor was set into place and we, as volunteers, are permitted on the beach to turn the HSCs during their spawning season when our beach is closed, May 6 to June 6. Please keep in mind that this is permitted before dawn and after dusk in order to not disturb the migrating birds. So we are diligent and passionate Volunteers, often flipping at 12 midnight and 4:00 a.m.

I can honestly tell you that the Horseshoe Crabs have not yet reached their pre-decline population (nor have the migrating birds) and wholeheartedly and with great passion ask the ASMFC to reconsider their wish to reopen the harvest not only for the males but more particularly for the [females.as](#) they carry the future of this magnificent and ancient species.

Please let's continue to allow them to recover. We need your help.

Thank you for your consideration.

Sincerely,

Gail C. Howarth, RTF Volunteer.

Reeds Beach NJ

From: [Faith brancato](#)
To: [Comments](#)
Cc: [Bonnie Oconnor](#); [Ted Brancato](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Thursday, September 1, 2022 10:56:42 AM

Please keep your current policy protections for female horseshoe crabs which will protect the red knot birds.

From: [Frederick Weber](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Thursday, August 25, 2022 4:57:16 PM

Please do not approve the harvesting of more Horseshoe crabs in Delaware Bay. The few Red Knots that are left depend on the eggs or they can't make it to their arctic breeding grounds. This is one of the most wonderful migrations on the planet and people are willing to snuff it out for products which have substitutes available. The way we're going driving other species toward extinction is going to backfire on us and we will eventually go extinct. What happens to our wildlife will happen to us!

I remember seeing thousands of Red Knots along the Delaware Bay shore feeding on abundant Horseshoe Crab eggs in the 1970s and 80's. It was beautiful. And now it's almost gone due to human greed.

Fred Weber
Branchville, NJ

From: [G](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft addendum VIII
Date: Thursday, September 29, 2022 9:30:23 PM

To Whom It Concerns:

I am someone who enjoys and values the Delaware beaches and it's fragile ecosystem. I want to say i disagree with the proposal to let female horseshoe crabs be used as bait.

Horseshoe crabs are an invaluable resource for science and vaccines. Since the Delaware area houses and acts for a mating ground for the most horseshoe crabs in the world, we have a special responsibility.

Thank you for reading this!
Gaige L
Delaware resident

From: [Gary Nennstiehl](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Friday, September 30, 2022 4:26:49 PM

I am opposed to changing the current fishery regulations for the harvesting of horseshoe crabs to allow the harvesting of female crabs. The current management plan was developed after the drastic reduction of the horseshoe crab population in the 1990's due to overharvesting for the commercial eel and whelk fishery. As you know, the current plan does not allow for harvesting of female HSC. Unfortunately, we have not seen a significant increase in the horseshoe crab population. One reason for this is the increased use of HSC (horseshoe crabs) for the medical industry. Other factors may also be involved, such as habitat destruction due to over development on our beach and bay fronts, as well as climate changes. Adding the harvest of female HSC would negatively impact the fragile population. Since we have a healthy ratio of male to female HSC, a better solution would be to increase the harvest of male crabs. This protects the female crab allowing her to produce millions of eggs per season. The HSC is vital to the food chain in our bay ecosystems by providing food for shore birds and fish. We can not afford to lose this valuable resource.

Thank you,
Gary Nennstiehl
17251 Birch Ct
Lewes, DE 19958

From: [Gaspar Bakos](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Sunday, September 11, 2022 10:31:48 PM

Dear Sir/Madam,

I am strongly opposing the increase of the harvest of horseshoe crabs. In fact, I am shocked that any such harvest is possible at all.

I join NJ Audubon in opposing the Atlantic States Marine Fisheries Commission's (ASMFC) proposal to increase the harvest of horseshoe crabs, including a harvest of females for the first time in over a decade. This action will have a significant impact on the federally threatened Red Knot and other shorebirds that depend on horseshoe crab eggs during spring migration stopovers in Delaware Bay, putting them at risk of further population declines.

With best regards,

Gaspar Bakos

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+-----+
Gaspar Bakos
Professor of Astrophysics
133 Peyton hall, 4 Ivy lane
Department of Astrophysical Sciences, Princeton University
Princeton, NJ 08544, USA
office: +1-609-258-9926 fax:+1-609-258-8226
+-----+

From: [Gigi Brisson](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Thursday, September 29, 2022 12:16:08 PM

I am writing to firmly express my concern with the proposed management of horseshoe crabs. The bottom line is that the numbers of crabs are down and quotas should be reduced, not increased, until the crabs reach their "high water mark", that is the largest number we have on record. Only under these conditions will they multiply in numbers that can support even the current quotas.

You are all aware of the mass dependence on these crabs; their lifecycles, and their eggs. The red knot is especially dependent, traveling thousands of miles to reach the beaches where these eggs have been laid, only to continue for thousands of miles to breeding grounds. Their numbers are significantly lower and it is your responsibility to not only protect the shores of the Atlantic Ocean and its creatures, but all dependent on them. It is one big ecosystem and if you blow a hole in one part, you will see the other parts cascading downward. These animals enable this ecosystem to work, as the plants and animals are all dependent on each other, and we (humans) get to benefit in the resulting beauty and resilience of our coastline. Yes, do not forget that as these plants and animals intertwine, as they have for millions of years, they build a natural resilience to storms and surges, which is needed now more than ever. Any coastal scientist could connect the dots for you, if you were interested in understanding the critical relationships.

Please think about the LONG TERM. You are to manage this coastline not just for those alive now, but for future generations; your kids, your grandkids, and so on. Further, please consider the elimination of using this critical species as bait. There are other choices. Please be smart and wise and protect what we know and love - our beautiful shoreline. Protecting each participant in this delicate ecosystem will help keep what we love.

Gigi Brisson
Cape May, NJ 08204

From: [Ginger A Rebstock](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Tuesday, September 6, 2022 7:16:09 PM

Dear ASMFC members,

While I agree that updating procedures and statistical models to determine harvest rates is a good idea, I strongly oppose any changes that would increase harvest of horseshoe crabs in Delaware Bay, or allow harvest of females.

Horseshoe crab eggs are essential for several species of shorebirds, not just red knots, and are also essential for the continued population of horseshoe crabs. The use of horseshoe crabs for bait seems like a waste of a resource that is needed by wildlife and biomedical research.

The Draft Addendum VIII states: "Since its implementation in 2013, neither the 81,900 red knot threshold nor the 11.2 million female horseshoe crab thresholds have been met and harvest package 3 has been selected every year by the Framework and specified by the Board for the Delaware Bay bait harvest limit." New regulations should have the goal of managing harvests to meet those thresholds (or other thresholds based on more recent research). Hence if the thresholds are not met, harvest should be reduced continuously until they are met. Harvest package 3 allows the harvest of up to 500,000 males (and 0 females). Perhaps harvest package 1 or 2 should be implemented until the thresholds are met.

I urge you to prioritize long-term preservation of species and ecosystems over short-term profits.

Thank you for considering my comments.
Sincerely,

Ginger Rebstock

Ginger Rebstock, PhD
Center for Ecosystem Sentinels
Dept. of Biology, Box 351800
University of Washington
Seattle, WA 98195-1800
gar@uw.edu
ecosystemsentinels.org

From: [Gordon keen](#)
To: [Comments](#)
Subject: [External] Horseshoe Crabs
Date: Wednesday, September 28, 2022 11:11:57 AM

I am opposed to raising the quotas on harvesting horseshoe crabs. You have got to be kidding!
Sincerely, Gordon Keen.

From: [Grant Price](#)
To: [Comments](#)
Subject: [External] Horseshoe Crabs
Date: Tuesday, September 13, 2022 5:54:56 PM

We are completely opposed to raising limits on Horseshoe crab harvesting. The birds that depend on them are declining rapidly and some are in danger of extinction. As an example, the Red Knots are for the most part seen only one two beaches, and in low and diminishing numbers.

The harvest is basically for two purposes:

1. Bait for eel pots. Not only does this benefit a very small number of individual people. Furthermore, the eels themselves are quite depleted, and should not currently be subjected to increased fishing pressure.
2. Medical uses: No longer necessary, there are functional synthetic methods of achieving the same goals.

We encourage you to do the responsible thing, and not increase take limits for Horseshoe crabs in or around the Delaware Bay.

From: [Caitlin Starks](#)
To: [Comments](#)
Subject: FW: [External] Draft of addendum to the Horseshoe Crab Fishery
Date: Friday, September 30, 2022 9:11:22 AM

From: Glen Smith <glenleesmith@yahoo.com>
Sent: Thursday, September 29, 2022 9:44 PM
To: Caitlin Starks <cstarks@asmfc.org>
Subject: [External] Draft of addendum to the Horseshoe Crab Fishery

If raising quotas on the killing of horseshoe crabs would be destructive to our fisheries.

I believe this may in the short term may make fishermen some additional profit may give them a

smile. Would this be a good move for the long term? Shouldn't we be fighting for protection.

The crabs numbers are declining wouldn't this also effect birds that are dependent of the horseshoe

crabs?

I hope you will weigh your decision in favor of your children's world.

Thank You for your consideration,

Glen L. Smith

From: [Guylaine Thom](#)
To: [Comments](#)
Subject: [External] Horse shoe crabs
Date: Tuesday, September 27, 2022 2:52:38 PM

We need, now more than ever to protect our oceans and waterways along with the creatures that inhabit them.

Do not allow the overfishing of horseshoe crabs!

Guylaine Thomas

Sent from my iPhone

From: [Holly Dunbar](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Wednesday, September 28, 2022 2:16:41 PM

I am writing to express my strong opposition to lifting the ban on the harvesting of female horseshoe crabs.

Many species of migrating birds, including endangered species, are dependent on the horseshoe crab eggs in spring. Overharvesting of horseshoe crabs has already helped to bring about a decline in the numbers of migrating birds.

I am appalled that we would put so many species and an entire ecosystem at risk simply to harvest and kill these ancient creatures for use as bait.

Holly J. Dunbar
725 Ayres Avenue
North Plainfield, N.J. 07063-1607
hdunbar@verizon.net

From: [Grant Stevenson](#)
To: [Comments](#)
Subject: [External] Horseshoe Crabs and Red Knots
Date: Saturday, August 13, 2022 10:03:24 PM

Hi Caitlin and the Commission,

Is it that we need to choose a package we recommend and why given the best of our knowledge, and previous facts plus the modeling in the ARM Framework? I guess I am confused as to how a public commenter can be helpful and contribute most to the process. I have some thoughts as an amateur ornithologist and birder.

I would say, while Package 1 is ideal for birding and the birds, uses of Horseshoe Crabs like fish bait and biomedical are very important, too. So the optimal choice may be two or three, and see what happens with the monitoring. Caution is the better part of valor because of the sensitive life cycles of both organisms and that recent history shows that the wrong quota can have devastating consequences. Then if monitoring and subsequent modeling show increasing or decreasing the annual quota prudent, then the commission can reassess.

My experience as a bird person is it sometimes is best to work on good faith with industry to find common ground even if interests conflict, though I do not see this as so. As long as you continue to keep conservation organizations like the IUCN and NJ Audubon involved, I see no problem with a moderate approach. (I am not an expert at population ecology and conservation, but one I believe can use population energetics to determine many questions on how many animals one needs, a little studied approach. It is touched on in the ARM report.)

If additional comment is allowed, I may like to possibly get back after talking over the framework with professional ornithologists.

Thank you very much for the opportunity and your time and consideration.

Grant Stevenson
Fountain Hill, PA

From: [Gregg Gorton](#)
To: [Comments](#)
Subject: [External] Proposed Increase in Crab Harvest
Date: Monday, September 12, 2022 5:01:36 PM

Good people:

I believe it would be a huge mistake for the limit on female horseshoe crab harvesting to be lifted, and for an overall increase in the numbers harvested. Neither the number of Red Knots nor the crab census have achieved anywhere near sustainable numbers. Risk of the Red Knot extinction persists!!

Please make the wisest decision for these precious animals in what is truly a critical situation for them.

Gregg E Gorton, M.D., DLFAPA (ret.)
President
Delaware Valley Ornithological Club
president@dvoc.org
Narberth, PA, USA

From: [James Leiser](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Tuesday, September 13, 2022 1:56:29 PM

Dear ASMFC,

As a resident of the Delaware River watershed, I believe we need to continue to protect the horseshoe crabs. In particular, the impacts of Blue Catfish as a new invasive species have not been fully seen. They are already decimating the blue crabs, and it is not time to risk lowering the totals of horseshoe crabs until more data is available.

Sincerely,
James Leiser
james.leiser@gmail.com

119 Nitche RD
SHOHOLA, PA 18458-3517
United States

From: [ivyandlace51](#)
To: [Comments](#)
Subject: [External] Horseshoe crabs
Date: Sunday, September 11, 2022 12:13:22 PM

Do not harvest!
Leave them alone!
Use another bait!
Stop this nonsense...they are prehistoric, for G-d's sake!

Sent from my Verizon, Samsung Galaxy smartphone

From: [GWEN RARING](#)
To: [Comments](#)
Subject: [External] Increase in horseshoe crab harvest
Date: Monday, September 12, 2022 10:51:15 AM

I believe it would be a mistake to increase the harvest and/or allow the harvesting of horseshoe crabs at this time. J
P Hand

Sent from my iPhone

From: [Jamie Johnson](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Addendum VIII
Date: Wednesday, September 14, 2022 11:15:08 AM

I am writing to submit my comments regarding and opposition to Horseshoe Crab Addendum VIII.

The current population of American horseshoe crabs has not recovered from overharvesting in the 1990's, and has declined at least 60% in the last 25 years. As a keystone species that provides calorie dense food for many other species, this is incredibly troubling.

Horseshoe crabs are not counted when they're bycatch from the destructive practice of dredging. When their blood is harvested by the pharmaceutical industry, which is extremely stressful for the animal, upwards of 29% die when returned to the water.

In fact, as a result of overharvesting for use as food, bait and biomedical testing, and because of habitat loss, the American horseshoe crab is listed as **Vulnerable to extinction** and the tri-spine horseshoe crab is classified as Endangered on the IUCN Red List of Threatened Species.

For these reasons, I do not understand how ASMFC could possibly propose to increase bait quotas and include female horseshoe crabs. **The data is showing us that the current methods of management are not working because the population of horseshoe crabs is not stable and is declining.** Why make matters worse by increasing quotas and including females? This simply does not make sense.

The data is showing us that we should be considering ending the taking of any horseshoe crabs at all. Or, at the very least, reducing quotas and protecting females. Certainly, adding to the quotas and including females will be disastrous for this species.

Therefore, I strongly urge you to reject the current proposed quotas and consider reducing quotas and protecting all horseshoe crabs, especially females. Thank you for your consideration.

Jamie Johnson
838 West End Avenue
New York, NY 10025
Tel (917) 834 3336

From: [Jane Wiltshire](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Thursday, September 29, 2022 10:05:40 AM

Hello, last night I emailed my reasons for requesting that you do not end the prohibition on harvesting female horseshoe crabs and decrease the numbers of crabs permitted to be harvested. I would like to add that climate change is creating additional threats to the shorebirds and horseshoe crabs because of increased temperatures on land and in the water and increased violent storms in the Atlantic Ocean. So we need to increase protections of the very vulnerable shorebirds and horseshoe crabs, not decrease them.

Thank you very much for your consideration.

Sincerely,
Jane Wiltshire

From: [Jane Wiltshire](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Wednesday, September 28, 2022 9:32:13 PM

Please do not end the prohibition on harvesting female horseshoe crabs or increase the number of horseshoe crabs permitted to be harvested.

As you know, the numbers of shorebirds whose very lives depend on horseshoe crab eggs are perilously low, and especially the very threatened red knots. I thought the old management plan determined that red knot numbers needed to increase to 81,000 and the female crabs numbers needed to increase to 11 million. Neither species is anywhere close to these numbers, so why is this terrible change even being considered? **Our amazing little red knots number less than 7000. This proposed change may very well cause us to lose them completely, and what a terrible tragedy that will be.** The shorebirds and horseshoe crabs' existence need less horseshoe crabs to be harvested, not more, and certainly not the females to be harvested at all.

The pharmaceutical industry does not need our help. It is a gazillion dollar industry. But our wildlife need desperately need our help and protection. Please please please do not end the prohibition on harvesting female horseshoe crabs or increase the numbers of horseshoe crabs permitted to be harvested.

Thank you.
Jane Wiltshire
139 Ridgewood Avenue
Villas, NJ 08251

From: plainfuzz@aol.com
To: [Comments](#)
Subject: [External] Horseshoe Crab Harvest
Date: Sunday, September 11, 2022 7:33:26 PM

Please don't increase the harvest on horseshoe crabs and don't allow the fishing of female horseshoe crabs. Our shorebirds are already under a lot of pressure for survival.
Jane J. Wainer, member NJ Audubon.

From: jbergeron@optonline.net
To: [Comments](#)
Subject: [External] Horseshoe crab draft addendum
Date: Friday, September 2, 2022 8:47:58 PM

Please do not allow harvesting of female or male horseshoe crabs. When I was growing up, horseshoe crabs were abundant along the Delaware Bay in North Cape May. But horseshoe crabs aren't abundant these days, and neither are red knots. In the 1990s, horseshoe crabs were overharvested as bait, leading to dramatic drops in crab and red knot populations. Red knots are now listed as threatened under the federal Endangered Species Act.

Since 2008, New Jersey has tried to protect red knots by imposing a moratorium on harvesting horseshoe crabs for bait in state-controlled waters.

Although New Jersey bans the harvest of horseshoe crabs for bait within state-controlled waters (three miles or less from the shoreline), there are no limits beyond the three-mile mark and they can be harvested for their blood for pharmaceuticals. As a result, trawlers from many nearby states capture horseshoe crabs off the New Jersey coast. Even on the Delaware side of Delaware Bay, fishermen can still legally harvest male horseshoe crabs as bait.

The ASMFC new model would eliminate a longstanding policy decision not allowing the harvesting of any female horseshoe crabs until the populations of both crabs and red knots return to higher levels. The current ASMFC model recognizes that horseshoe crab eggs are essential to the survival of red knots, and states that no harvesting of female horseshoe crabs will be allowed until the population of red knots rebounds to 81,000 and the population of horseshoe crabs reaches 12 million.

We don't want to take any risks we can avoid. One way we can protect them is to not allow harvests of horseshoe crabs because they provide the eggs the birds need. Horseshoe crab and Red Knot populations have not returned to 1980 levels since their crash even after New Jersey's moratorium on harvesting the crabs. My husband and I don't want to take any risks with the possible extinction of red knots. Using horseshoe crabs for bait is just not worth it.

From: [Janice A Stanton](#)
To: [Comments: Janice Shabib Stanton](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Wednesday, September 28, 2022 12:22:44 PM

Hello,

I am writing to you today to ask that you please continue to keep strong protections for horseshoe crabs in place. These creatures eggs are essential for migrating endangered species such as the Red Knot, among others.

Also, the use of their blood is inhumane and unnecessary given the fact that there is a proven synthetic alternative. We, as humans, have a responsibility to act in a way that allows all creatures to survive, not to be disposable for human needs.

I desperately request that the protections continue and are strengthened for the future. I appreciate your time. Thank you.

Janice A Stanton

From: [Janice Badkin](#)
To: [Comments](#)
Subject: [External] Horseshoe crabs
Date: Friday, September 9, 2022 10:16:07 PM

Do not increase horseshoe crab limits!!!

From: [Jason Orans](#)
To: [Comments](#)
Subject: [External] Regarding horseshoe crab management
Date: Tuesday, August 23, 2022 10:54:50 AM

Please do ****NOT**** approve the expansion of harvesting female horseshoe crabs at the ASMFC 2022 Summer Meeting on Wednesday, August 3, 2022.

At minimum, the original safeguards in your harvest policies prohibiting female horseshoe crabs from being harvested until Red Knot numbers recover need to be included in any new policies.

Thank you.

Jason Orans

From: [Jennifer B](#)
To: [Comments](#)
Subject: [External] Comment on ASFMC proposal
Date: Friday, August 26, 2022 1:54:58 PM

17 Godfrey Dr.
Hamilton, NJ 08610

Caitlin Starks
Senior FMP Coordinator
1050 N Highland St., Suite 200 A-N
Arlington, VA 22201
comments@asmfc.org

8/26/22

Subject: Horseshoe Crab Draft Addendum VIII

Dear Ms. Starks:

I am writing to voice my opposition to the ASFMC proposal to change/lift/remove the horseshoe crab harvest controls protecting female horseshoe crabs from being harvested. These magnificent creatures have survived thousands of years, but in addition to facing environmental stressors like climate change, their numbers are dwindling due to biomedical and bait industries.

Moreover, shorebirds such as the threatened beloved Red Knot, which are heavily dependent on the eggs of the horseshoe crab to fuel their long and epic journey to their nesting grounds in the Arctic, are already at-risk. Allowing female horseshoe crabs to be harvested would decimate the delicate relationship on which the Red Knots survival literally depends. Nature is astonishing, and the journey these small birds undertake is truly impressive, but they need fuel to fly that far. And to diminish that food source further would be an unnecessary tragedy for both the crabs and the shorebirds.

The marvelous, prehistoric horseshoe crabs have been around for centuries and they thrive without interference by man, but their very survival is continually threatened by humans. **Please** limit human interference with their essential contribution to the delicate ecosystems in which they participate and do **NOT** allow harvesting of the horseshoe crab. I fully oppose changing the Delaware Bay horseshoe crab harvest and sincerely hope the ASFMC will REJECT the proposed harvest change.

Thank you for your time.

Sincerely,

Jennifer Barron

From: [Jennifer Vogt](#)
To: [Comments](#)
Subject: [External] Don't increase horseshoe crab harvest
Date: Wednesday, August 24, 2022 5:51:29 PM

Mr. John Clark, Chair
Horseshoe Crab Management Board
Atlantic States Marine Fisheries Commission

Mr. Clark,

I am writing to express my concerns regarding the possible action by ASMFC at its Summer Meeting of the Horseshoe Crab Management Board to substantially modify the policies and approaches to protecting the crabs and red knots of Delaware Bay through a highly-technical modification to the Adaptive Resource Model (ARM) utilized by the Commission, through the initiation of Addendum VIII.

The impact of the central parts of the revisions – to change the harvest restrictions and reopen the bait fishery’s access to female horseshoe crabs despite the lack of recovery to date of the red knot populations which depend on the eggs they produce – is buried under hundreds of pages of technical discussions. Leading members of the ASMFC’s own advisory committee have tried raise this concern to the primacy it deserves, and even the Peer Review Committee urged caution. Further, this fundamental change in policy and risk to the recovery of the red knot is being done behind the closed doors of the modeling committees without robust and engaged public consideration of the acceptability of the risk to important stakeholders including the broader public and conservation community. Requests by leading members of the conservation and environmental communities for access to the models have been denied.

Even the outside Peer Review Committee raised concerns about the shift in policy embedded in technical changes and the adequacy of how well public and stakeholder concerns were taken into account. I doubt that the public’s tolerance to the possibility of red knot extinction is as high as this new ASMFC direction envisions. In the Peer Review report, the experts advised:

“Because the changes would lead to harvest of female HSC, which has been restricted since the implementation of the original ARM Framework, the Panel cautions the [Working Group] to fully consider if the new reward function truly represents the values articulated by stakeholders in the 2009 ARM Framework.”

I strongly urge the Commission to not approve the proposed Framework Revision.

Under the current framework, no female crabs can be harvested in Delaware Bay for bait until the female population reaches 11.2 million crabs or the total red knot stopover population reaches 81,900 birds. Neither metric has yet been attained.

Under the proposed management revision, 175,000 to 190,000 females could be harvested as soon as 2023, according to some experts. In reaching this decision, the ASMFC disproportionately relied on surveys it has long considered biased and of dubious accuracy, which “reduces the scientific credibility” of the proposed revision, according to committee members and former proponents of the ARM framework (Niles, Burger, Mizrahi, & Dey, 2021).

The *only* horseshoe crab-specific survey thought historically reliable—the Virginia Tech trawl survey—continues to indicate that female horseshoe crabs are in trouble.

I would request that the Board hold the draft addendum until it can be amended to reinclude the original, stakeholder based protections regarding recovery levels prior to reopening female crab harvest, and that the

fundamental modeling and other technical analyses foundational to the addendum's recommendations be publicly shared and fully made available and reviewed by interested stakeholders.

Thank you for your attention to these comments.

Sincerely,
Jennifer Vogt

Sent from my iPad

From: [Graver, Jeffrey](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII)
Date: Tuesday, September 27, 2022 1:20:32 PM

My comment to the commission. I will keep it short and simple. From information gathered from the Delaware Center for the Inland Bays I believe that female horseshoe crabs should not be harvested. A better solution would be to harvest more male horseshoe crabs. If we continue down this path it would end in the collapse of the species.

Thank You,
Jeffrey Graver

From: [Jill Mortensen](#)
To: [Comments](#)
Subject: [External] Horseshoe crab
Date: Tuesday, September 27, 2022 6:48:30 PM

Please protect horseshoe crabs, especially females. We are working hard to increase horseshoe crab numbers and protect them and their spawning in order to help migrating birds.
It's the circle of life- we must protect.
Jill Mortensen

Sent from my iPad

From: [Graves, Jessica](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Monday, September 12, 2022 4:41:59 PM

To Whom it May Concern,

I strongly disagree with the addendum that would allow for harvesting of female horseshoe crabs. Not only would this be detrimental to the horseshoe crab population, but bird populations would also suffer, as migrating species rely on the horseshoe crab eggs for food.

This addendum is short-sighted and has far reaching consequences for the animals that live in and visit the Delaware Bay.

Thank you,

Jessica Graves, SHRM-CP

She/Her/Hers

Human Resources Assistant

Carnegie Museums of Pittsburgh

4400 Forbes Avenue

Pittsburgh, PA 15213

412-622-3338

www.carnegiemuseums.org



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From: [Jill Madsen](#)
To: [Comments](#)
Subject: [External] Horseshoe Crabs & Red Knots
Date: Saturday, January 29, 2022 2:07:19 PM

Hello,

I'm writing out of concern for 2 very important species that are currently in peril. The Red Knot is especially in peril these days. I'm asking that you reconsider your potential concession to industry at the cost of these wonderful creatures. Please consider the future of these animals and their lack of sustainability if you cave to industry. They need our help now more than ever!

Thank you,

Mrs. Jill Madsen
Colorado Springs, CO

From: [JMAmann](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Wednesday, September 28, 2022 9:07:41 AM

Horseshoe crab harvest should NOT include females.

A better alternative is to harvest more, or even all, male crabs. The male-to-female ratios are high in this area. Harvesting more males would not affect repro8rates. This will allow females to continue growing and reproducing, which is the best way to protect estuary ecosystems recovering from over harvest and facing the negative impact of the rapid climate change we are experiencing.

Thank you for the tremendous amount of science that goes into the management of the crab as well as for your commitment to considering public input.

Kindest regards,

JoAnn

JoAnn Amann
301.655.9235 cell w/voice and text
JMAmann@Comcast.net

"The past is a foreign country; they do things differently there."

Sent via the Samsung Galaxy Note8, an AT&T 5G Evolution capable smartphone

From: [Joan Flaherty](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Wednesday, September 28, 2022 10:09:01 AM

Atlantic States Marine Fisheries Commission,

Thank you for the excellent work you do to manage horseshoe crabs and for inviting public comment on the draft revised management plan. My concern is the harvesting of female horseshoe crabs. It should not be allowed at this time. Why?

- Rapid climate change and rampant coastal development are reducing the quality of the crabs' spawning habitat, which most likely will impact its future population.
- The crab population is being managed at a historic low from the 1990s.

A better alternative to harvesting female crabs is to harvest more male crabs. Because male-to-female ratios are high in our coastal area, harvesting more males would not affect reproduction rates.

Our environment is truly interdependent and once one element is destroyed beyond repair other elements, such as birds, (red knots), will also be impacted. I hope you will consider this concern and support a management practice that protects female horseshoe crabs.

Respectfully,

Joan Flaherty
82 Sussex Street
Rehoboth Beach, DE 19971

From: [James Cohen](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Friday, September 30, 2022 8:17:55 AM
Attachments: [image003.png](#)

Horseshoe crab numbers are not increasing and are reported to be decreasing. The population is already stressed and diminishing with a resulting strain on the bird population which relies on horseshoe crabs for food. Sea temperature rise seems to not have been researched into its effects on the horseshoe crab and other marine life in the Delaware Bay area but is undoubtedly having negative repercussions.

I strongly urge that Addendum VII NOT be adopted.

Thank you.

Jim Cohen

James Cohen, PE
[James Cohen Consulting](#)
PO Box 615
Richboro, PA 18954
O: 215-355-6859
M: 917-733-0204
F: 215-396-8593
JCohen@JCConsultingEngineers.com
<https://www.linkedin.com/in/jamescohenpe/>
www.JCConsultingEngineers.com



From: [Joan Wood](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Harvest
Date: Sunday, September 11, 2022 2:18:33 PM

Really?!! Are you really going to INCREASE the harvest on these strange creatures that feed thousands and thousands of endangered birds that need the food and rest as they migrate? Are you really willing to make New Jersey look that crass and cruel and stupidly unaware of what we would be doing? Maybe you don't care what our state looks like and its reputation in the world for being crass and cruel and stupid. But for those of us who were forced to move here about 45 years ago, felt despair at the thought, and then came to love the state, its people and nature, this is just...awful. Please don't.

yours truly,
Joan Wood
Lawrenceville, NJ

From: [John Hoyt](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Wednesday, September 28, 2022 12:23:01 PM

I respectfully request that the harvest of female horseshoe crabs should not be allowed at this time.

--Rampant development in the coastal Delaware Bay (DE and NJ) is detrimentally impacting spawning areas.

--The crab population is being managed at a historic low from the 1990s.

--Female horseshoe crabs annually produce thousands of eggs that are essential food for migrating birds such as the Red Knot. Red Knots in eastern North America have declined sharply in recent decades owing in part to the unsustainable harvest of horseshoe crab eggs, and they have become a flagship species for shorebird conservation. It is estimated that over \$800 billion is spent a year in outdoor recreation in the United States, with birdwatching having an economic benefit of \$41 billion dollars.

Regards,
John Hoyt
311 W 4th St
Lewes, DE 19958

From: glroerer@comcast.net
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Thursday, September 29, 2022 6:43:12 PM

As a New Jersey resident and taxpayer, I am writing to you and urge the Atlantic States Marine Fisheries Commission (ASMFC) to vote against Option B for Addendum VIII which would change the Adaptive Resource Management (ARM) model for horseshoe crab harvest. The new model would recommend opening a limited female harvest. I ask you to adopt the "no action" option.

"The horseshoe crab is a critical link to coastal biodiversity. One of their ecological functions is to lay millions of eggs on beaches to feed shorebirds, fish and other wildlife. Its large hard shell serves as microhabitat for many other species such as sponges, mud crabs, mussels and snails. Unfortunately, this ecological link can be broken in areas where population density is low."

I have read your information and conclusions and find some of them to be to be specious at best.

My Experience

In May of 1993 I became a volunteer member of the New Jersey Division of Fish and Wildlife, Endangered and Non-Game Species Program as a beach steward in Fortescue, NJ on the Delaware Bay. I have been there every spring since for about 30 years. In the early years we were asked to estimate and document Red Knot numbers. I would routinely record numbers of knots in groups of 3, 4 and 5 thousand. This year, as in the past few years, there were a few groups numbering only in the hundreds. Likewise with the HS crab, their numbers coming up to spawn is much less than in the early years. While more females may be on the beaches now, this only shows that more females are now mature at egg laying age, not that the numbers of females have increased in the entire population. While my observations may be anecdotal in nature, my anecdotal information is no more or less valuable than your anecdotal observations used for your report. For instance, your report states that, "*Horseshoe crabs are also encountered as bycatch in several other commercial fisheries. Commercial dead discards were estimated for the Delaware Bay Region as part of this ARM Revision with data from the Northeast Fisheries Science Center's Northeast Fisheries Observer Program. Commercial dead discards were not considered as a source of removals in the previous ARM Framework but are now included in this ARM Revision.* This is anecdotal information.

Medical Use

In your overview document it states that, "A 15% mortality rate is applied to the number of horseshoe crabs bled and released alive to estimate the number of crabs that die each year. This source of removals was not accounted for in the previous ARM Framework but is now included in the ARM Revision. The biomedical harvest data for the Delaware Bay Region is confidential, so coast wide biomedical data has been used for the revised ARM model development." I believe that the medical information is confidential because it is most likely manipulated data.

"A 2014 study by researchers at [the University of New Hampshire and Plymouth State University](#) found that the bleeding process results in lower activity levels and a decreased expression of tidal rhythms. *While it is true that further study is required, the data available does suggest the horseshoe crabs that survive bleeding are left disorientated and weak, potentially affecting the ability of female crabs to spawn. Further research has found that the mortality rate of horseshoe crabs post-bleeding is only eight percent for males, but as high as 30 percent for females.*

Your use of 15% mortality is just a guess and not representative of actual mortality. Your report does not account for issues with bled crabs that survive this bleeding process, which would be 100% of the HS crabs used.

Critical Habitat

On 07/15/2021 the U.S. Fish and Wildlife Service (Service), proposed to designate critical habitat for the federally threatened rufa red knot (*Calidris canutus rufa*) under the Endangered Species Act of 1973, as amended (Act). You reference this in your report but fail to mention and account for other issues confronting the HS crab and red knot.

Sea Level Rise

In this report it states that, *However, we also concluded, based on overwhelming evidence, that rates of sea level rise have increased beyond those that have occurred over recent millennia and continue to accelerate (Service 2014, pp. 142-143; Intergovernmental Panel on Climate Change (IPCC) 2013, pp. 11, 25). These conclusions are further supported by newer information evaluated in the SSA report (Service 2020a, pp. 32-36). Over the period 1902 to 2015, global mean sea level rose by 0.5 feet (ft) (0.16 meters (m)) (likely range of 0.4 to 0.7 ft (0.12 to 0.21 m)) (IPCC 2019, p. 42). The rate of sea level rise since the mid-19th century has been larger than the mean rate during the previous two millennia (high confidence) (IPCC 2014a, p. 4). Extreme wave heights, which contribute to extreme sea level events and coastal erosion, have increased in the North Atlantic by around 0.3 in (0.8 cm) per year over the period 1985 to 2018 (medium confidence) (IPCC 2019, p. 42).*

Habitat

When arriving in the Delaware both the HS crab (spawning) and knots (feeding) share the same habitat. According to the critical habitat document, "*The rufa red knot is vulnerable to inundation of tidal flats and erosion of sandy beaches, which are typically caused or accelerated by climate-driven sea level rise (Service 2014, pp. 126-143; Vousdoukas et al. 2019, entire). In most of the rufa red knot's nonbreeding range, shorelines are expected to undergo dramatic reconfigurations over the next century as a result of accelerating sea level rise (USCCSP 2009, pp. 13, 44, 50). Extensive areas of marsh are likely to become inundated, which may reduce foraging and roosting habitats. Marshes may be able to establish farther inland, but the rate of new marsh formation (e.g., intertidal sediment accumulation, development of hydric soils, and colonization of marsh vegetation) may be slower than the rate of deterioration of existing marsh, particularly under the high sea level rise scenarios (Nikitina et al. 2013, p. 11; Glick et al. 2008, p. 6). The primary rufa red knot foraging habitats, intertidal flats, and sandy beaches will likely be locally or regionally inundated or eroded, but replacement habitats are*

likely to re-form along the shoreline in its new position (Scavia et al. 2002, p. 152; USCCSP 2009, p. 186). However, if shorelines experience a decades-long period of high instability and landward migration (i.e., under higher rates of sea level rise), the formation rate of new beach habitats may be slower than the rate of loss of existing habitats (Iwamura et al. 2013, p. 6). Additionally, low-lying and narrow islands, such as those along the U.S. Gulf and Atlantic coasts, may disintegrate rather than migrate (Titus 1990, p. 67; IPCC 2014b, p. 15), representing a net loss of rufa red knot habitat. Galbraith et al. (2002, p. 178) examined several scenarios of future sea level rise and projected major losses of intertidal habitat in Delaware Bay.”

Your report fails to account for these future anticipated detrimental changes and hurdles affecting HS crabs.

Offshore Turbine Wind Power Development

The State of New Jersey and most of the states in the northeast United States are beginning the industrialization of the coast. Your report fails to discuss potential impacts of the wind farms on the HS crab.

General Impacts

According to the Bureau of Ocean Energy Management (BOEM), Ocean Wind 1 Offshore Wind Farm, Draft Environmental Impact Statement, June 2022, “The Proposed Action would result in **negligible to moderate** impacts for finfish, invertebrates, and EFH. The primary impacts on finfish would be from noise during construction and operation of the proposed Project. Long-term impacts on EFH from construction and installation of the Proposed Action would be minor, as the resources would likely recover naturally over time. The Proposed Action would have negligible to minor impacts on invertebrates through temporary disturbance and displacement, habitat conversion, and behavioral changes, injury, and mortality of sedentary fauna. The presence of structures may have a minor beneficial effect on invertebrates through an “artificial reef effect.” Despite invertebrate mortality and varying extents of habitat alteration, BOEM expects the long-term impact on invertebrates from construction and installation of the Proposed Action to be minor, as the resources would likely recover naturally over time. The Proposed Action would contribute a noticeable increment to the **negligible to moderate** impacts on finfish, invertebrates, and EFH from the combination of the Proposed Action and other ongoing and planned activities.”

3.13.5.1 “Activities associated with construction and installation, O&M, and decommissioning of the Proposed Action alone would have negligible to minor impacts on invertebrates through temporary disturbance and displacement, habitat conversion, and behavioral changes, injury, and mortality of sedentary fauna. The presence of structures may have a minor beneficial effect on invertebrates through an “artificial reef effect.” Despite invertebrate mortality and varying extents of habitat alteration, BOEM expects the long-term impact on invertebrates from construction and installation of the Proposed Action to be minor, as the resources would likely recover naturally over time. In general, the impacts are likely to be local on the scale of the benthic invertebrate geographic analysis area, and thus would not be expected to extend to the far larger geographic analysis area (New Jersey LME). The larger invertebrate geographic analysis area was selected to account for migratory movement of mobile species that are predicted to experience negligible impacts with respect to the Proposed Action’s contribution to the impacts of individual IPFs resulting from ongoing and planned activities. The primary impacts on invertebrates would be expected to occur as a result of new cable emplacement, the presence of structures, noise from pile driving, and anchoring.”

Electromagnetic Fields – EMF

Naturally occurring Electromagnetic Fields (EMFs) are present everywhere in the oceans. Undersea cables used for power transfer are known sources of EMF. For offshore wind energy projects, the primary sources of EMF are inter-array cables that carry electricity from each wind turbine to the export cables, which carry that electricity to shore.

3.13.5 “Effects of EMF may include interference with navigation that relies on natural magnetic fields, predator/prey interactions, avoidance or attraction behaviors, and physiological and developmental effects (Taormina et al. 2018).”

As I mentioned earlier, I have read your information and conclusions and find some of them to be to be specious at best. There are many holes with your data since much of it comes from sources who want the crab moratorium lifted for financial reason and are more subjective in nature and less objective. You also fail to account for future issues that will be detrimental to the HS crab, like sea level rise, habitat loss and industrialization of much of the coast for wind farms.

In *Laudato Si'*, his letter to the Catholic Church on caring for the environment, Pope Francis covered a wide array of issues including our treatment and view of animals. “Every act of cruelty towards any creature is ‘contrary to human dignity.’”

“If we approach nature and the environment without this openness to awe and wonder, if we no longer speak the language of fraternity and beauty in our relationship with the world, our attitude will be that of masters, consumers, ruthless exploiters, unable to set limits on their immediate needs. By contrast, if we feel intimately united with all that exists, then sobriety and care will well up spontaneously.”

Please, think of future generations and the continued survival of the HS crab and red knot. Support the **no action** option.

John Gfrorer, 491 Hamilton Road, Wenonah, NJ, 08090. gfrorer@comcast.net, 856-292-3805

From: calogero@rockisland.com
To: [Comments](#)
Subject: [External] Let the horseshoe crabs be
Date: Friday, September 30, 2022 5:11:56 AM

Hello Caitlin Starks,

Dr. Sylvia Earle has informed us that you and the Atlantic States Marine Fisheries Commission are considering raising quotas of harvesting horseshoe crabs for bait, and potentially harvesting female horseshoe crabs, too.

Have you determined that there are too many horseshoe crabs?

Have you determined that there are too many migrating birds dependent on the eggs of the horseshoe crabs?

I suspect there are alternatives for bait, which would allow the ancient horseshoe crabs continue to mate and in turn support healthy populations of migrating birds as they have done since time immemorial, long before humans interfered with this marvel of life.

Let the horseshoe crabs be.

Sincerely,

John Calogero

From: [joanne Pannone](#)
To: [Comments](#)
Cc: [joanne Pannone](#)
Subject: [External] Opposing ASMFC lifting moratorium on female horseshoe crabs
Date: Tuesday, August 23, 2022 10:48:10 AM

My first experience with horseshoe crabs was to attend an outing with the Delaware Riverkeeper on the Moores beach of the Delaware Bay to tag spawning horseshoe crabs by moonlight and there I learned that it takes 7 years to reach maturity!

We can fly to the moon, we need to find a substitute for the horseshoe crab and also save the red knot from being starved out on their migration. The female population is not increasing which could be that those being bled aren't surviving.

Until then, do not lift the ban!

Joanne Pannone
215 Meadowbrook Rd, Robbinsville, NJ 08691

From: [John Moy](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Wednesday, August 24, 2022 9:41:19 PM

Dear ASMFC:

Please do not allow the harvesting of female Horseshoe crabs. Horseshoe crabs are endangered, as are the Red Knots who depend on their eggs for food.

Using your ARM framework, you should not be allowed to increase harvest. I do not understand how the "Catch every last fish" mindset can persist in this day and age. You have all these management frameworks in place, yet build in loopholes so that they can be effectively ignored. Some day in the not so distant future there will be nothing left.

John Moy
25 Eel Point Road
Nantucket, MA 02554
jmoy@ospf.org
617-784-1872

From: [John McCrory](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Sunday, September 11, 2022 1:44:30 PM

Atlantic States Marine Fisheries Commission
1050 N. Highland Street, Suite 200 A-N
Arlington, VA 22201
comments@asmfc.org

VIA ELECTRONIC MAIL

Dear Commissioners:

I write to urge you not to approve the proposal to increase the harvest of horseshoe crabs, which includes a harvest of females for the first time in many years. The existing Adaptive Resource Management (ARM) framework, created in response to sharp declines in the population of both Horseshoe Crabs and Red Knots, has not yet enabled these populations to stabilize or to reverse course from their current trajectory toward extinction. Consequently, now is not the time to change the framework to allow harvesting of female Horseshoe Crabs.

As you know, the population of Red Knots that stop at Delaware Bay each spring on their epic journey from Tierra Del Fuego to the Arctic Circle are critically dependent on the eggs of the horseshoe crabs there. There are many factors that endanger the Red Knot such as long-term climate change impacts on their breeding but the annual harvest of horseshoe crabs, if it were to include female horseshoe crabs, is one that could have immediate, near-term impacts on their population. The existing framework's prohibition on harvesting female horseshoe crabs is one of the strongest tools we have to protect the Red Knot population.

As a citizen, a parent, and amateur naturalist, I recognize the Red Knot's special importance. With one of the longest and most challenging migrations of any bird species in the world, it is a key species for understanding migration in general than unlocks an understanding which enables us to understand the needs of many more species, particularly other long-distance migrants. By protecting the Red Knot, we can learn ways to protect many more species of birds, including many other shore birds that rely on the eggs of the horseshoe crab in Delaware Bay. The Red Knot is a keystone in our developing knowledge of the avian world, and hence deserves every effort to reverse its current trajectory towards extinction.

The sharp declines in the populations of Red Knots stopping over at Delaware Bay in recent decades from nearly 94,000 individuals in 1989 have not yet been halted. Despite the current framework's limits on the harvesting of horseshoe crabs, the availability of horseshoe crab eggs to Red Knots remains spotty. Unsurprisingly, though the population counted from year to year has ticked up and down over the past decade, the population of Red Knots remains at historic lows. The increase from an all-time low of 6,800 individuals in 2021 to 12,000 this year is nevertheless far below the 30,000 peak number of 2019. Though that peak suggested cause for hope that might have allowed for a new approach to the horseshoe crab harvest, the data since then clearly point to the need to stay the course with the existing framework at the very least.

I hope you will agree that all the information we have shows conservation efforts in Delaware

Bay still have a ways to go in the case of the Red Knot, and that we should in fact do more to protect and expand the supply of horseshoe crab eggs that Red Knots rely on, not less. The proposed change to the ARM will likely increase the threat to Red Knot right now.

The data clearly show that such a change to the framework is premature and ill-advised at this time. I join New Jersey Audubon and others and strongly urge you to reject the proposal.

Respectfully,
John McCrory
Montclair, New Jersey

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John McCrory
john@johnmccrory.com
(603) 715-7080

From: [John](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Tuesday, September 27, 2022 4:25:33 PM

Hello with respect to harvesting Horseshoe crabs, females should be off limits of severely curtailed.

thanks,

john mccloskey

From: jfluard@netzero.net
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Sunday, August 28, 2022 5:11:04 PM

Please extend all protections for Horseshoe crabs.

Other sources are available for bait.

**John Luard
58 Red Coach Lane,
Rumson, NJ 07760**

From: [Jon Leland](#)
To: [Comments](#)
Subject: [External] Extend the prohibition on harvesting female horseshoe crabs
Date: Wednesday, August 24, 2022 1:01:14 AM

Hi - I'm writing to request that you do not approve the proposal that would end the prohibition on harvesting female horseshoe crabs this week. These horseshoe crab populations are far too important for both human health and other species, like the Red Knot. I would ask that the ASMFC provide the modelling and analysis which justifies the expansion of the harvest of female horseshoe crabs for the public to review, and ensure that the original safeguards in their harvest policies prohibiting female horseshoe crabs from being harvested until Red Knot numbers recover are included in any new policies.

Thank you,

Jon Leland

[Jon Leland](#)
Chief Strategy Officer
Head of Sustainability
he/him/his
[Kickstarter](#) is a [Public Benefit Corporation](#).
[Some projects we love.](#)

From: [John Roecker](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Wednesday, September 28, 2022 9:56:10 AM

Atlantic States Marine Fisheries Commission:

I respectfully submit to you that the harvest of any gender horseshoe crabs should not be allowed at this time.

I - I have surveyed horseshoe crabs at Cape Henlopen State Park for over 10 years with Richard Julien and Robert Schroeder. I do not know the results of this Spring's count, but it seems to me that the count was considerably lower than previous years.

- Female horseshoe crabs annually produce thousands of eggs that are essential food for migrating birds, particularly the Red Knot which is in decline.

- Rampant development in coastal Delaware is detrimentally impacting spawning areas.

- Please be on the right side of the environment and history by supporting the revised plan. Our environment is truly a web and once one element is destroyed beyond repair other elements, such as birds will also implode.

Respectfully submitted.

Dr. John T Roecker
20451 Mall Center Way
Lewes, DE 19958

Sent from my iPad

From: [Joseph Cunin](#)
To: [Comments](#)
Subject: [External] Changes to Horseshoe Crab regulations
Date: Tuesday, August 16, 2022 3:22:19 PM

Horseshoe crabs play a vital role to the Delaware Bay ecosystem, as their eggs provide nourishment for imperiled shorebirds such as the federally threatened Red Knot. Each year, thousands of Red Knots fly over 9,000 miles from Tierra del Fuego at the southern tip of South America to breeding grounds in the Arctic Circle. The Delaware Bay is a major stopover point during this long journey, where the Red Knots feast on horseshoe crab eggs to gain the necessary weight to fly the remainder of the way to the Arctic Circle.

I urge ASMFC **NOT** to adopt new rules that would allow increased harvest of horseshoe crabs. The current restrictions are working and are critical to maintaining shorebird populations.

Thank you,

Joseph Cunin
Brooklyn, NY

From: [Joshua Malbin](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Wednesday, August 17, 2022 3:47:32 PM

I recently learned of your proposal to expand the harvesting of female horseshoe crabs even though the Red Knot population has not recovered. Red Knots are in serious danger, having reached their lowest total number ever in 2021, and having declined 75 percent in the last 40 years, and female horseshoe crab numbers have not recovered either. The ASMFC must make public any modeling and analysis that justifies any expansion of the catch of female horseshoe crabs. Any new policies must keep in place the original safeguards in place prohibiting the catch of female horseshoe crabs until Red Knot numbers recover. If that means adopting the no action alternative, then that is the alternative you should adopt.

Thank you,

Joshua Malbin
Brooklyn, NY



Virus-free. www.avast.com

From: [Joshua Heffron](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Monday, August 29, 2022 4:23:09 PM

STOP OVER FISHING OF THE HORSE SHOE CRABS

From: [Josh Corris](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Monday, August 29, 2022 10:47:04 AM

Dear Sir or Ma'am,

I am concerned about the consequences of overharvesting of horseshoe crabs on the local environment. I implore you to implement measures to prevent harvesting of horseshoe crabs at harmful levels.

Thank you,
Joshua D Corris

From: [JUDY SWITZER](#)
To: [Comments](#)
Subject: [External]
Date: Tuesday, September 27, 2022 2:01:57 PM

No to the plan to change the quotas on horseshoe crabs! This would have a devastating effect on crucial migrating birds including the Red Knot already under severe stress.

What are you thinking??

Judith A. Switzer

From: [Karen Bacot](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Tuesday, August 23, 2022 1:03:02 PM

It annoys me so much that they continue killing so many horseshoe cabs. Don't the idiots know better??? Very frustrating.

Sent from my iPhone

From: [Julie Callahan](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Wednesday, September 28, 2022 8:57:07 AM

Atlantic States Marine Fisheries Commission:

I respectfully submit to you that the harvest of female horseshoe crabs should not be allowed at this time.

--Female horseshoe crabs annually produce thousands of eggs that are essential food for migrating birds.

--Rampant development in coastal Delaware is detrimentally impacting spawning areas.

--The crab population is being managed at a historic low from the 1990s.

--Horseshoe crabs have existed for millions of years and yet within a few hundred years humans have endangered their existence. What does that say about humanity?

Please be on the right side of the environment and history with the revised plan. Our environment truly is a web and once one element is destroyed beyond repair other elements, such as birds, (an important tourist draw), will also implode.

Julie Callahan
38263 Comegys Court
Lewes, DE. 19958

Sent from my iPhone

From: [Judith Weis](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Tuesday, August 23, 2022 10:49:27 AM

I am a marine biologist and am concerned about the status of horseshoe crabs, which have been on this planet far longer than most other species. Overharvesting of horseshoe crabs by the bait industry has put an additional severe strain on the ecological connection between horseshoe crabs and shorebirds like the threatened Red Knot, a connection that is already weakening due to climate change. Surely there are other sources of bait for whelks than these special ancient animals! The Red Knots and other shorebirds depend on eggs of horseshoe crabs to sustain them during their long migration. Despite the fact that the Red Knot population is already alarmingly low, the ASMFC has proposed allowing the harvest of female horseshoe crabs, whose eggs provide the food that fuels the birds' journey up to Arctic nesting grounds. One doesn't have to be a biologist to see that such a policy makes no sense at all and will be harmful to the species and the ecosystem. Please do not approve this.

Sincerely,
Judith S. Weis
Professor Emerita

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1880's: "There's lots of good fish in the sea" W.S. Gilbert
1990's: Many fish stocks depleted due to overfishing, habitat loss, and pollution.
2000's: Marine reserves, ecosystem restoration, and pollution reduction MAY help restore populations.

Dr. Judith S. Weis
Dept. of Biological Sciences
Rutgers University
Newark NJ 07102

<http://sites.rutgers.edu/judith-weis/>

From: [karen barker](#)
To: [Comments](#)
Subject: [External] horseshoe crab draft addendum VIII
Date: Sunday, September 25, 2022 8:55:50 AM

Dear Atlantic states marine fisheries commission members,

I urge you to institute a full moratorium on horseshoe crab harvest in the Delaware bay.

I am a 40+ year biology teacher and an avid Birder. I teach my students about the ecology of many ecosystems including marine ecosystems. Birds are connectors to all of those and horseshoe crabs are crucial as the underpinning of this healthy ecosystem.

Sincerely,
Karen Barker
Newark, Delaware

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"I love my country, by which I mean I am indebted joyfully to all the people throughout its history who have fought the government to make right." - Ani Difranco

From: [Caitlin Starks](#)
To: [Comments](#)
Subject: FW: [External] horseshoe crab draft addendum VIII
Date: Friday, September 23, 2022 1:27:52 PM

From: longokedkk@aol.com <longokedkk@aol.com>
Sent: Friday, September 23, 2022 1:19 PM
To: Caitlin Starks <cstarks@asmfc.org>
Cc: longokedkk@aol.com
Subject: [External] horseshoe crab draft addendum VIII

Dear Caitlin Starks-

Please reconsider your proposal to harvest female horseshoe crabs (and hopefully also do not increase male harvest)!!!

I am a volunteer with the De Inland Bays group and participate in terrapin studies, horseshoe crab counts and docent at James Farm. This year I participated in the horseshoe crab count at James Farm, and although you may think the numbers are strong, I can tell you from observation that less were seen on the beaches and less eggs were seen as well- have you been out to these counts, or do you just take in the "data" without making observations in the field? It makes me sad to think that any organization would consider harvesting female horseshoe crabs. Many qualified scientists and naturalists have written about your proposal and why it is a BAD IDEA! You stated that YOU see a less than 1% chance of red knot decline based on female harvest...HOWEVER, as mentioned "we are ceding the amount of red knot, and we have NOT even met the goal to restore the red knot population"!! Our surveys do not show a significant increase in crab numbers; an underestimation of horseshoe crabs will be at the expense of fish and birds that need them to survive- IS THIS WHAT WE WANT FOR OUR FUTURE??!! Destabilizing the horseshoe crab and red knot populations in the De bays could have future tragic consequences for the entire ecosystem. There are many reasons not to do this. Why do humans always have to desimate and destroy nature... IT WILL BE THE END OF ALL OF US!

Please reconsider your position on harvesting horseshoe crabs...the species that has been around since the dinosaur.

In closing, I hope you will listen to the many knowledge individuals and organizations who are against this proposal and not allow this change in horseshoe crab harvest to occur!

Thank You,
Karen Longo

From: kmreinfried@everyactioncustom.com on behalf of [Kay Reinfried](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Friday, September 30, 2022 11:33:46 PM

Dear Atlantic States Marine Fisheries Commission,

As a supporter of birds and the places they need to thrive, I am writing to strongly oppose the Atlantic States Marine Fisheries Commission's (ASMFC) proposed Addendum VIII Interstate Horseshoe Crab Fishery Management Plan, which increases the number of horseshoe crabs harvested for use as bait and reopens the harvest to include female horseshoe crabs.

The decline in horseshoe crab populations is concerning along the Atlantic Coast. It is especially important along the Delaware Bay, given its importance as a horseshoe crab spawning area and important stopover point for migrating red knots. Several indicators show that both horseshoe crab populations and the population of red knots, which depend their eggs as a source of food, are well below recovery thresholds.

I urge the commissioners to vote no on Addendum VIII for the following important reasons:

1. Horseshoe crab populations remain at historic lows, and their ongoing use both for bait threatens their ability to recover to their historic population levels.
2. Red knot populations are at all-time lows from both climate change and increasing scarcity of the food needed to fuel their 9,000-mile migration.
3. There are alternatives to using horseshoe crabs for the bait industry
4. Nature-based tourism and associated economic activity in the coastal Mid-Atlantic region is vital to local economies that depend on healthy ecosystems and the abundance of horseshoe crabs and the red knot

It is concerning that the proposed revision would likely trigger a resumption in the harvest of female horseshoe crabs, which would make recovery of the species virtually impossible. Under the current ASMFC framework, there is no female crab harvest until female abundance reaches 11.2 million crabs or until the Delaware Bay total red knot stopover population reaches 81,900 birds. Neither red knot nor horseshoe crab populations are anywhere close to satisfying either metric, nor yet, under this addendum, female harvest could be allowed.

The joint collapse of red knots and horseshoe crabs is not inevitable. However, the draft addendum propels them closer to that grim reality. I urge you to vote no on Addendum VIII in order to protect the red knot and the places they need to survive, protect healthy ecosystems in the Delaware Bay, and to support local economies dependent on nature-based tourism that is such a critical component of the communities surrounding the Delaware Bay.

Sincerely,
Mrs. Kay Reinfried
797 Scott Ln Lititz, PA 17543-8868
kmreinfried@gmail.com

From: [Kathy Sgroi](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Thursday, September 22, 2022 9:01:44 PM

To Whom it may Concern,

I strongly object to the harvesting of female horseshoe crabs. Having participated in a survey this year with the DE Center of Inland Bays, I saw first hand how outnumbered the female population is to the males.

I do not believe that harvesting of females given our current state of climate change and coastal development is a sound strategy.

Kathy Sgroi

From: [Kasia Chmielinski](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Tuesday, August 23, 2022 4:03:28 PM

Dear Caitlin Starks and ASMFC,

I am writing to you as a concerned citizen and the co-founder of a local Feminist Bird Club Chapter to oppose the Atlantic States Marine Fisheries Commission (ASMFC) proposal that would endanger Delaware Bay horseshoe crabs and the migratory shorebirds (like the Red Knot) which depend on them.

Originally, it was agreed that the prohibition on harvesting female horseshoe crabs would not be lifted until the Delaware Bay region hosts at least 81,900 Red Knots or 11.2 million female horseshoe crabs. Neither of these scenarios has occurred, yet the ASMFC has proposed changes that would result in lifting the prohibition on harvesting female horseshoe crabs, further imperiling the food supply for the remaining Red Knots.

This is coming at a time when the Red Knot population is far from stable. The average Red Knot count at Tierra del Fuego for 2018-2020 declined more than 75 percent from average counts in the 1980s and 2000. In 2021, only 6,800 Red Knots were counted, which is by far the lowest count since surveys began. These birds are hurtling towards an uncertain future and you have the power to stop this.

Please do your part in protecting the wildlife and biodiversity that keeps our regional ecosystem rich and balanced.

Thank you,
Kasia Chmielinski

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Kasia Chmielinski

From: [Kelly Hughey](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab harvesting limits
Date: Tuesday, September 27, 2022 2:18:34 PM

To whom it may concern,
Please continue prohibiting female horseshoe crabs' harvesting until the numbers reach 11.2 million.
Thank you,
Kelly Hughey
2412 shamrock Lane Millville NJ 08332

From: [KATHY AND DAVID DEVINE](#)
To: [Comments](#)
Subject: [External] Horseshoe Crabs
Date: Thursday, September 29, 2022 6:56:24 PM

To whom it may concern. I am writing to ask you to vote no on the draft addendum to the Horseshoe Crab Fishery Management Plan. At this time I believe there should be more restrictive plans put in place to protect them. Thank you very much. Kathy and David Devine

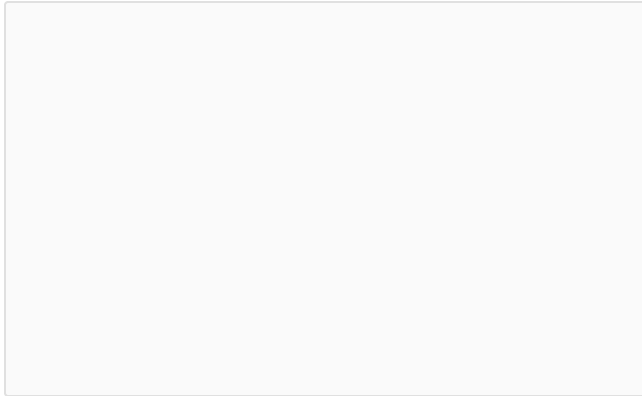
Sent from my iPhone

From: [kevin kavinsky kavar](#)
To: [Comments](#)
Subject: [External] Horseshoe crab comment
Date: Thursday, September 29, 2022 10:19:45 AM

Totally against allowing harvesting of horseshoe crabs , for gods sake like it's the only bait for
welk ???

Kevin brennan frankford Delaware

From: [Ken Gigliello](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Friday, September 30, 2022 8:48:13 AM



I oppose the harvest of female horseshoe crabs for the following reasons:

1. Data from the only survey specifically developed to track our crab population does not show a significant increase in crab numbers
2. The population is being managed based on a historic low point set at the peak of crab over harvest in the 1990's.
3. Climate change and coastal development are reducing the quality of the crab's spawning habitat, which will likely impact its future population.
4. A better alternative is to harvest more male crabs. Because male to female ratios are high in our area, harvesting more males would not affect reproduction rates.
5. Allowing female crabs to continue growing and reproducing is the best bet to protect estuary ecosystems recovering from over harvest and facing the impacts of rapid climate change.

Please take these comments into consideration when finalizing the report.

From: [Kim Morris](#)
To: [Comments](#)
Subject: [External] Horseshoe crabs
Date: Monday, September 5, 2022 2:56:07 AM

Please **DO NOT LIFT THE MORATORIUM** on harvesting female horseshoe crabs.

Sent from my iPhone

From: [Krisanne Baker](#)
To: [Comments](#)
Subject: [External] Horseshoecrabs
Date: Friday, September 30, 2022 7:19:50 AM

We must preserve, as stewards, other species of the planet, not use and abuse them. I have been a volunteer counter for the resurging horseshoecrab population here in Maine ever since the ban to use them as fishing bait. With joy Ive watched the numbers each mating season climb back to what they should be. These prehistoric creatures have endured on this planet for almost forever. It would be shameful if we humans to wipe them out in a couple of decades!

Respectfully submitted,
Krisanne Baker

Ecological Artist and Educator
<https://www.krisannebaker.com>

Sent from my iPhone

From: [Kristi MacDonald](#)
To: [Comments](#)
Subject: [External] I oppose increased horseshoe crab harvest
Date: Monday, September 12, 2022 9:29:15 AM

Dear ASMFC representatives:

The proposed Horseshoe Crab Draft Addendum VIII of the Horseshoe Crab Fishery Management Plan puts the horseshoe crab population, and the many shorebirds (including threatened and endangered species such as the Red Knot), wading birds, and other species that rely upon them as a food resource during migration and the breeding season at risk of further perilous decline. I strongly oppose the proposal to increase the harvest of horseshoe crabs, including a harvest of females for the first time in over a decade. Climate change, bringing sea level rise and ocean acidification, will certainly exacerbate the decline of both Horseshoe Crabs and the many birds that rely upon them so increasing harvest at this time is not acting in the interest of the longterm existence of these species or the fisheries that rely upon them. It is wasteful to increase the use of these ancient animals for bait when they serve such a critical role in the fragile ecosystems of the Delaware Bayshore.

I hope the ASMFC will make the responsible decision of protecting Horseshoe Crabs and the species that rely upon them by not adopting Addendum VIII of the Horseshoe Crab Fishery Management Plan.

Sincerely,
Kristi MacDonald
59 Anderson Hill Rd.
Bernardsvill, NJ 07924

From: leslie.porter2@verizon.net
To: [Comments](#)
Cc: hq@njudubon.org
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Friday, September 30, 2022 2:47:48 PM

Comments submitted to the Atlantic States Marine Fisheries Commission.

Date: Friday, September 30, 2022.

From: Ms. Leslie G. Porter
825 Brice Rd.
Rockville, MD 20852-1001
301-251-5166, home telephone

Re: the proposal to increase harvest quota of horseshoe crabs, also known as *Limulus polyphemus*, for use as bait by potentially reopening future harvests to include female horseshoe crabs.

I, Leslie Gibson Porter of Rockville, Maryland, ask the Atlantic States Marine Fisheries Commission to maintain, ensure, and enforce critical protections for horseshoe crabs.

I am opposed to increasing the quota of harvest of horseshoe crabs for use as bait.

Secondly, I am adamantly opposed to including female horseshoe crabs in any planned or allowable future harvests of horseshoe crabs until the female horseshoe crabs population in the Mid-Atlantic states region reach 11.2 million horseshoe crabs or the Red Knot avian species stopover population in the Delaware Bay reaches 81,900 birds.

Ideally I would prefer to have both scenarios fulfilled before any increase in horseshoe crab harvests are considered.

Going forward, ASMFC must be required to include horseshoe crab egg density data survey numbers collected by the Delaware Bay Shorebird Project and other conservation organizations, as well as field survey data on Red Knots in ASMFC's modeling when considering future increased horseshoe crab harvests.

I join New Jersey Audubon in opposing the Atlantic States Marine Fisheries Commission's (ASMFC) proposal to increase the harvest of horseshoe crabs, including a harvest of females for the first time in over a decade. Allowing this proposal to go forward will have a significant negative impact on the federally threatened Red Knot and other shorebirds who depend on horseshoe crab eggs during their spring migration stopovers in the Delaware Bay, putting them at risk of further population declines.

Thank you.

Sincerely,
/s/
Leslie G. Porter

From: [Lani Hummel](#)
To: [Comments](#)
Cc: lanihummel@aol.com
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Friday, September 30, 2022 9:08:18 PM

I have been enamored with horseshoe crabs for nearly 6 decades. As a young person, I became fascinated with this ancient species so little changed in hundreds of millions of years. I loved seeing the annual spectacle of thousands of horseshoe crabs mating and providing the food necessary for Red Knot birds to have the energy to reach their Arctic breeding grounds.

Under the current ASMFC management scheme, both the horseshoe crab and the Red Knot bird populations are declining. As a result, the Red Knot has been listed as threatened under the Endangered Species Act, and the horseshoe crab has been labeled as Vulnerable by the International Union for the Conservation of Nature. Scientists have attributed the Red Knots' shrinking populations to a decrease in the supply of horseshoe crab eggs. In the 1980s and early 1990s, there were 50,000 horseshoe crab eggs per square meter in Delaware Bay. Today, there are 8,000 crab eggs per square meter.

It was agreed that the prohibition on harvesting female crabs would not be lifted until the Delaware Bay region hosts at least 81,900 Red Knots or 11.2 million female horseshoe crabs. Neither of these benchmarks has been reached, yet the ASMFC is proposing changes that would remove the prohibition on harvesting female horseshoe crabs, further imperiling the food supply for the remaining Red Knots. For this and many other reasons, I am opposed to the implementation of Addendum VIII.

Thank you for your consideration,

Lani Hummel
901 Bay Ridge Road
Annapolis, MD 21403

From: [LeAnn](#)
To: [Comments](#)
Subject: [External] Horseshoe crabs
Date: Sunday, September 11, 2022 12:21:36 PM

Please save the female horseshoe crabs from harvesting. These eggs are vital to the red knots.

Sent from my Verizon, Samsung Galaxy smartphone

From: [Lloyd Goodman](#)
To: [Comments](#)
Subject: [External] female horseshoe crabs
Date: Saturday, September 3, 2022 3:27:11 PM

They are environmentally important, so PLEASE do whatever you can to save them,
Thank you.

Lloyd Goodman
175 King of Prussia Road
Radnor, PA 19087-4521
610-687-4049

From: [Liza Hodskins](#)
To: [Comments](#)
Subject: [External] Horseshoe crab draft addendum VI I I
Date: Wednesday, September 28, 2022 11:45:24 PM

Please allow males to be harvested but not females. We rely on the females to continue the population. Thank you.

Liza Hodskins

Rehoboth Beach Pawradise

20502 Washington Street Rehoboth Beach, Delaware 19971

From: [Leslie Pessemier](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Sunday, September 11, 2022 1:02:23 PM

I join the NJ Audubon and oppose the Atlantic State Marine Fisheries proposal to increase the harvest of horseshoe crabs, especially the FEMALES! It will threaten the Red Knot and other shore birds ALL of which are declining. Let's all make a concerted effort to save the very creatures our survival depends on.

Thank you,

Leslie Pessemier
DENVILLE, NJ 07834

Sent from my iPhone

From: [Liz Flyntz](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Tuesday, August 23, 2022 8:16:36 PM

Hello,

I am writing to express my concern about the planned horseshoe crab harvest. This harvest is leading to declining numbers of the crabs, and to declining numbers of the shorebirds that depend on the crabs for food. Please do not allow the harvest to go forward, and take steps to preserve our shoreline ecology.

Thank you,
Liz Flyntz

--

www.lizflyntz.net

From: [Lisa McNamara](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Wednesday, September 7, 2022 7:32:15 AM

To Caitlin Starks,

Please note that I **strongly oppose** the overharvesting of female horseshoe crabs and urge you to **reject** the ASMFC's proposal now. The results of this act would have catastrophic consequences.

Lisa McNamara

From: [Belinda](#)
To: [Comments](#)
Subject: [External] Horseshoes crabs
Date: Sunday, September 11, 2022 12:29:45 PM

I am against the Commission's (ASMFC) proposal to increase the harvest of horseshoe crabs, including a harvest of females for the first time in over a decade. This action will have a significant impact on the federally threatened Red Knot and other shorebirds that depend on horseshoe crab eggs during spring migration stopovers in Delaware Bay, putting them at risk of further population declines.

Linda Ulrich
blulrich31@comcast.net

Get [BlueMail for Android](#)

From: [Madison Kitchen](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Friday, September 23, 2022 9:49:08 AM

Good morning,

Based on the scientific data presented by the Delaware Center for Inland Bays, I do not support opening horseshoe crab harvest up to female crabs. The intense development pressure that southern Delaware is experiencing is and will continue to adversely affect the water quality of our shores, which in turn impacts habitat for these animals. Female crabs lay millions of eggs which sustains the population currently being harvested, therefore should not be taken out of the system as bait.

Please do not pass this addendum.

Madison Kitchen

From: [Lynn Ebeling](#)
To: [Comments](#)
Subject: [External] horseshoe crab draft addendum VIII
Date: Sunday, September 11, 2022 1:10:08 PM

I'm writing to tell you that I oppose the ASMFC's proposal to increase the harvest of horseshoe crabs, including the harvesting of female crabs. This increase is irresponsible and will put the red knob at risk of further population decline.

Sincerely, Lynn Ebeling

From: [Lowell Lysinger](#)
To: [Comments](#)
Subject: [External] Horseshoe crab protections
Date: Tuesday, September 27, 2022 2:31:12 PM

To Whom it may concern,
Please take steps to further protect horseshoe crabs in our region.

This summer I participated in a rescue where thousands of the crabs were washed into the marshy areas in the Delaware bay area due to abnormally high tides. The tides created giant washouts that swept them out of the bay and into the marshes. We saved lots of crabs but sadly had to leave hundreds if not thousands behind to bake in the sun and die.

I observed many more male crabs than female crabs and I fear that anything that harms female crabs could definitely impact their population.

The tides are very likely historically big because of climate change and this combined with other human cause threats to their survival - like habitat loss, harvesting for bait, etc. and should be factored into the decision on whether or not they should be harvested without a collapse in their population.

Please take steps to further protect this valuable animal.

Thanks,

Lowell Lysinger Jr. and Family
1551 Pinewind Dr.
Alburtis PA, 18011

215-387-6229



From: [Lonnie Autry Jr.](#)
To: [Comments](#)
Subject: [External] Horseshoe crabs
Date: Friday, September 30, 2022 10:02:25 PM

The Atlantic States Marine Fisheries Commission,

Please do not increase, or rather decrease the quotas for horseshoe crab harvesting on your Horseshoe Crab Fishery Management Plan. In these times of declining numbers in crabs and critically dependent birds, it is incredulous that an increase is being considered.

Lonnie Autry Jr.
New Castle, NH

From: [Margaret Sisson](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Thursday, September 29, 2022 7:35:38 PM

I oppose the Atlantic States Marine Fisheries Commission's (ASMFC) proposal to increase the harvest of horseshoe crabs, including a harvest of females for the first time in over a decade. This action will have a significant impact on the federally threatened Red Knot and other shorebirds that depend on horseshoe crab eggs during spring migration stopovers in Delaware Bay, putting plummeting shorebird populations at risk of further declines and extinction.

There is no compelling need for this increased harvest in the face of killing off other species and harming decimated populations of horseshoe crabs themselves which are an ancient species important to the ecology of the region you are responsible for. There are viable alternatives for medical uses and for inexpensive bait for which crabs are harvested and sold. With this proposed action ASMFC loses its credibility as attempting to protect our coastal biota, including our fisheries, to survive even in the short term.

Margaret Sisson
281 Stow Rd.
Harvard, MA 01451

From: [Margaret McMillen](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Thursday, August 25, 2022 8:41:40 AM

This message adds my voice of concern. I oppose the Atlantic States Marine Fisheries Commission (ASMFC) proposal that would endanger Delaware Bay horseshoe crabs and the migratory shorebirds (like the Red Knot) which depend on them.

"Overharvesting of horseshoe crabs by the bait and biomedical industries has put a severe strain on the ecological connection between horseshoe crabs and shorebirds like the threatened Red Knot. Although the Red Knot population is perilously low, the ASMFC has proposed allowing the harvest of female horseshoe crabs, whose eggs provide the food that fuels the final leg of the birds' journey to Arctic nesting grounds."

What is the matter with you people? Once gone, species cannot be replaced.

Industries should NOT be allowed to destroy our world's environment in pursuit of more or higher profits. Humans are not alone on this planet; we are supposed to be "good stewards" of this Earth and the creatures who share it with us!

Margaret McMillen

From: marciastutzman@netscape.net
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Sunday, September 25, 2022 7:53:36 AM

To whom it may concern:

I oppose the rule change proposed by the Atlantic States Marine Fisheries Commission (ASMFC) that recommends quotas along the Atlantic seaboard relative to the harvesting of Horseshoe Crabs.

Migrating shorebirds, including the threatened Red Knot under the federal Endangered Species Act, depend on Horseshoe Crabs. Each spring Horseshoe Crabs living in the Delaware Bay lay their eggs in the sand along the Bay's beaches. Migrating shorebirds feast on the eggs the Horseshoe Crabs lay in the sand to fuel their journey north to their breeding grounds. Gorging on nutrient-rich horseshoe crab eggs along the Delaware Bayshore allows the exhausted birds to quickly double their body weight and gain enough strength to complete their journey to nest and raise young in the north.

The ASMFC should not be allowed to switch to a new scientific model for assessing Horseshoe Crab populations, one it claims is more accurate, without actual unbiased scientific data input over years. Models are only as good as the data input into them. All models are wrong. All models can be manipulated easily to provide the answer being sought to support a decision. Speculations are not verified and validated data of what actually occurs in nature.

The new model eliminates the longstanding policy decision not allowing the harvesting of any female Horseshoe Crabs until the populations of both Horseshoe Crabs and Red Knots return to higher levels. Although the model was updated, policy safeguards are being removed. This could potentially allow the harvest of female crabs to resume.

The current ASMFC model states that no harvesting of female Horseshoe Crabs will be allowed until the population of Red Knots rebounds to 81,000 and the population of Horseshoe Crabs reaches 12 million. These numbers have not been seen in the Delaware Bay in a long time.

The ASMFC should keep the current policy protections for female Horseshoe Crabs. The ASMFC should not take any risks that may result in the extinction of Red Knots. Allowing the use of Horseshoe Crabs for bait is not worth the extinction of the Red Knot.

The document, "DRAFT ADDENDUM VIII TO THE HORSESHOE CRAB FISHERY MANAGEMENT PLAN FOR PUBLIC COMMENT" should not be approved proposed, but should return to the current policy safeguards in place for Horseshoe Crabs and Red Knots.

Sincerely,

Marcia A Stutzman
3422 Londonleaf Lane
Laurel, Maryland 20724
301-317-9698

From: [Marc Teitelbaum](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Sunday, September 11, 2022 11:15:13 PM

I oppose the harvest of female horseshoe crabs, which would be the first in over a decade. There was a reason for the ban on harvesting female horseshoe crabs, it could be a serious threat to the Red Knot and other birds that need the horseshoe crab eggs in order to survive. Why take a chance if it could hurt the survival of a species of birds? I also oppose the proposed increase of the harvest of horseshoe crabs in general.

Sincerely,

Marc Teitelbaum

Waretown, NJ

From: [MaryEllen Noonan](#)
To: [Comments](#)
Subject: [External] Horseshoe crab
Date: Sunday, September 4, 2022 2:33:14 PM

Please do not lift protections for Delaware bay horse shoe crabs. They are an ancient, integral part of the ecosystem that deserves to be protected. They must be protected to ensure their survival and the survival of those other species which are dependent upon them.

Sincerely,
Mary Ellen Noonan

From: [Mary Ann Levan](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Thursday, September 1, 2022 12:06:32 PM

NO NO NO NO NO NO NO NO NO

The Endangered Species Act provides strict protections for the rufa red knot, which is listed as threatened under the statute. The red knot's peak stopover population at Delaware Bay is at historically low numbers. Horseshoe crabs, whose eggs nourish the red knot at a critical point in its migration, have not recovered from decades of overharvest.

As crab numbers decline and red knots disappear from both Delaware and Argentina, the organization tasked with harvest management should not be toying with new models that accept harvesting of the crucial female crab resource. This is counter to the mandate of the agency, and is a short-sighted management plan. The economic gain from exploiting this resource is trivial, especially as opposed to the risk of extinction of an iconic migratory visitor the agency is bound to protect.

Now is not the time for ASMFC to revise its horseshoe crab management framework in a manner that would allow even greater harvest, including resumption of harvest of the critical female component of the population. Doing so would compound the threats facing the red knot and further jeopardize its recovery, in violation of the ESA. For these reasons, I urge ASMFC not to approve the proposed Framework Revision.

**Mary Ann Levan
Hockessin, DE 19707**

From: [Matthew Swanton](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Friday, September 30, 2022 1:21:37 PM

Dear Atlantic States Marine Fisheries Commission,

I am writing to you today to ask you to NOT allow female horseshoe crabs to be harvested under the new horseshoe crab management plan.

We need the females to continue to lay thousands of eggs every year to keep the population growing. They are such an important part of our ecosystem. Their eggs are a critical food for so many species of birds.

There is no need to include female horseshoe crabs in this program. It should only include male horseshoe crabs. We must protect the future!

Thank you,
Matthew Swanton
443-875-7477

From: [Maureen Fitzgerald](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Friday, September 30, 2022 8:27:00 AM

I am writing to you today to ask you to NOT allow female horseshoe crabs to be harvested under the new horseshoe crab management plan.

We need the females to continue to lay thousands of eggs every year to keep the population growing. They are such an important part of our ecosystem. Their eggs are a critical food for so many species of birds.

There is no need to include females in this program. It should only include males. We must protect the future.

Thank you,

Maureen Fitzgerald
35200 Seaport Loop
Lewes, DE 19958

From: [Mario Ruiz-Mesa](#)
To: [Comments](#)
Subject: [External] Horseshoe Crabs Harvesting
Date: Thursday, September 29, 2022 9:02:59 AM

I have a house on Delaware Bay and seen the decline in horseshoe crabs over the last 39 years, harvesting them is a crazy idea, the crabs are a food source for birds and are also used in vaccine research. If they are harvested they will become endangered, and you will have to spend millions trying to bring the population back!

Mario J. Ruiz-Mesa
Vineland NJ

From: [Michael Collins](#)
To: [Comments](#)
Subject: [External] Red knot population
Date: Friday, September 16, 2022 11:58:43 AM

My wife and I are at the beach nearly every day walking our puppy and i commented only yesterday about the few sand pipers we have seen so far this year. In years past it seems they have been plentiful but this year we saw only half a dozen yesterday. After reading an article by John Watson, Jr. in the Coaster Magazine , we now understand why there has been a reduction in one of our favorite beach birds. Hopefully a law can be passed to stop or curb fishing for horseshoe crabs to help rebuild the population.

Regards,
Michael Collins
Ocean Grove, NJ

Michael Collins
Sent from my iPhone

From: [MICHEL DUSSACK](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Thursday, August 25, 2022 8:02:13 PM

Oppose

Sent from my iPhone

From: [Beanyo Cat](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab harvesting
Date: Friday, September 30, 2022 4:42:23 PM

It is shortsighted and destructive to expand the harvesting of horseshoe crabs. If anything, we should be doing more to limit the harvest. The crabs are crucial for migrating birds. Where is our sense of stewardship and responsibility? If fisherman want to harvest them - they must be protected now so numbers can increase. Additionally, expanding the collection to include females is clearly not a vision for the future.

I urge the ASMFC to think longer term and more responsibly regarding the protection of this remarkable species.

Thank you.

Michele Brisson

From: [Nancy Mancison](#)
To: [Comments](#)
Subject: [External] Horseshoe crab
Date: Sunday, September 11, 2022 11:35:59 AM

I join NJ Audubon society in opposing the Atlantic States Marine Fisheries proposal to increase the harvesting of horseshoe crabs including the increase of females in over a decade.

Thank you for your consideration
Nancy Mancison

Sent from my iPhone

From: [Dan Kuntz & Nancy Burns](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Tuesday, September 13, 2022 10:42:50 PM

I oppose the ASMFC proposal that would allow the harvest of female horseshoe crabs in the Delaware Bay region. Continuing population declines of shorebirds that rely on horseshoe crab eggs during spring migration--particularly the federally threatened red knot--provide strong evidence that the existing moratorium needs to continue. Please protect the crabs, which play a vital role in this fragile ecosystem.

Nancy Burns
150 Locust Ave.
Hamilton, NJ 08610

From: nsleator@gmail.com
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Tuesday, September 13, 2022 3:20:35 PM

Dear ASMFC,

I am opposed to revising your standards for harvesting female horse shoe crabs for bait.

Protecting this species is critical to our ecosystem, and they are already at risk.

Nancy Sleator

Sent from my iPhone

From: [Molly Wiltshire](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII- public comment in opposition
Date: Tuesday, August 23, 2022 11:52:07 AM

Public Comment- Opposition to ASMFC proposed change to harvest controls for horseshoe crabs

We are ignorant in our desire to allow INDUSTRIES to do what's best for them while steamrolling OUR environment, OUR habitat, and OUR ecosystems. Enough! I am sick of industry playing games to force through changes that harm us all.

The conservation targets for horseshoe crabs have not been met. By continuing to overharvest these precious species, industry is causing knock-on effects to shorebird populations that rely on the crabs as a crucial food source.

This proposal of the Atlantic States Marine Fisheries Commission (ASMFC) proposal that would endanger Delaware Bay horseshoe crabs and the migratory shorebirds (Red Knots! Hello! Super important!) that depend on them.

Please do not change the horseshoe crab harvest controls to give ASMFC more control to devastate our environment and our species. I don't want this change. I want our beautiful shore ecosystem to improve, not worsen.

I live close to the Cape May bay shore and see these changes in real time. Strong opposition to this proposed addendum.

Regards,

Molly L Wiltshire
139 Ridgewood Ave
Villas, NJ

"What befalls the earth, befalls
all the sons of the earth."

From: [Monica Cardoza](#)
To: [Comments](#)
Subject: [External] Horseshoe crab harvest
Date: Sunday, September 4, 2022 3:47:26 PM

Hello,

Bait is replaceable. Horseshoe crabs and shorebirds are not replaceable.

I respectfully request that protections for these creatures not be weakened.

It's not just about fishermen and women, who certainly can find other types of bait. It's about the folk who come to the shore for birding, and they spend money to enjoy that hobby, staying in lodging and eating in restaurants. You want to increase tourism? Focus on all groups, not just one.

Thank you for your time.

Monica Cardoza

From: [Norman Torkelson](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Harvesting
Date: Tuesday, September 13, 2022 3:09:54 PM

You've got to be kidding!

Leave the horseshoe crabs alone to their own natural devices.

Mother Nature did not evolve these marvelous creatures over millions of years, only to be harvested for fish bait

Their eggs are an important food source for the migrating birds that stop here in our beautiful Delaware River Valley

STOP THE FOLLY for \$\$\$

Ban the harvesting

Sincerely

Norman Torkelson
18 B Risler Street
Stockton, NJ 08559

Sent from my iPhone

From: [Pat Catanzariti](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Wednesday, September 28, 2022 1:54:25 PM

To whom it may concern,

I'm writing to beg, plead on behalf of the female horseshoe crabs to not harvest them for fishing or the biomedical industry!

For eleven years I had the amazing privilege to live on Slaughter Beach and see first hand the beauty of these gentle creatures. These are the oldest living creatures on the planet. The value that these crabs bring to the world is still being explored and yet man continues to exploit them! When will we learn! The symbiotic relationship with the Red Knot bird population is critical, not to mention their extreme value their blue blood provides to protect us from humans in every saline bag. And more is still being researched about their extraordinary blood.

If all that is being proposed is to NOT capture/kill the female crabs so that their population can grow and be sustainable, then this is a small ask!! PLEASE!

And quite frankly, I'm not quite understanding why the fishing industry needs these gentle creatures for BAIT! Really? Is there nothing else that this industry can use as a substitute? Do they really need to kill these creatures that provide both an environmental and biomedical need for the planet?

Please, please stop this massacre!

Thank you,
Pat Catanzariti

From: [Pam Horovitz](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Harvest
Date: Sunday, September 11, 2022 7:04:57 PM

Dear members of the ASMFC.

I just found out that local fishermen want to change the law so that they can increase their haul of horseshoe crabs to USE FOR BAIT. That's not a good enough reason to threaten both the crabs and the shore birds like the Red Knot that depend on horseshoe crab eggs during migration.

I want to support our fishermen, but I also want to support the birds and marine life that make our shore diverse. Therefore I urge the members of the Atlantic States Marine Fisheries Commission to maintain critical protections for horseshoe crabs.

Thank you for considering my comments.

Pam Horovitz
517 Fislerville Rd
Mullica Hill, NJ 08062
Cell 856 745 5395

From: [Pam Young](#)
To: [Comments](#)
Subject: [External] Please do not allow this!
Date: Friday, September 2, 2022 7:17:01 AM

Female horseshoe crabs should not be used for bait! Please do not allow this!

Pam Young

Sent from my iPhone

From: [Peggy marshaleck](#)
To: [Comments](#)
Subject: [External]
Date: Sunday, September 11, 2022 11:30:30 AM

Good morning!

Please be considerate of the migrating red knots & the need for the horseshoe crabs future.

Yes, we've seen more crabs this year but not enough to change the law. This food source is critical and we truly hope you'll consider this before any decision.

Thank you for your time!

Joe & Peggy M

Narberth, PA

Sent from my iPhone

From: [Patti Drago](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Wednesday, September 28, 2022 12:18:30 PM

We support the recommendation by the DE Center for Inland Bays that only male horseshoe crabs be harvested.

Respectfully submitted,

Patti Drago & Rich Weissmann
17695 Venables Drive, Lewes, DE 19958i

From: [Paul West](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Tuesday, September 13, 2022 10:32:58 AM

I am writing to express my opposition to the Atlantic States Marine Fisheries Commission's proposal to increase the harvest of horseshoe crabs, including a harvest of females for the first time in over a decade.

This action will have a significant impact on the federally threatened Red Knot and other shorebirds that depend on horseshoe crab eggs as a food source during spring migration stopovers in Delaware Bay.

Any reduction in food sources will place additional stress on migrating shorebirds, which has the potential of resulting in further population declines of these species.

From: [Patricia Bernard](#)
To: [Comments](#)
Subject: [External] Please NO!
Date: Sunday, September 11, 2022 10:43:25 PM

Please Please Please NO NO NO on the proposal on the changes to the horseshoe crab protections. I will do anything I can to prevent enacting this newest proposal. Horrible horrible Horrible-----> Atlantic States Marine Fisheries Commissions

From: [Peter Boice](#)
To: [Comments](#)
Subject: [External] Proposed change to horseshoe crabs harvest limit
Date: Thursday, September 15, 2022 3:25:32 PM

I strongly opposing the Atlantic States Marine Fisheries Commission's proposal to increase the harvest of horseshoe crabs, including a harvest of females for the first time in over a decade. This action will have a significant impact on the federally threatened Red Knot and other shorebirds that depend on horseshoe crab eggs during spring migration stopovers in Delaware Bay, putting them at risk of further population declines.

Based on field work, including egg density studies conducted by the Delaware Bay Shorebird Project and other organizations, it is clear that horseshoe crab populations have not recovered from their population crash in the 1990s. Egg density data is the most reliable indicator of the horseshoe crab population, and importantly, it is the most reliable index of value for red knots and other shorebirds. Yet the Commission has never included these surveys in its modeling. The Commission also does not include field survey data for Red Knots, and these show that Red Knot populations are at historic lows.

To increase the harvest rate now would be extremely foolhardy!

Yours

Peter Boice

From: plizardman@aol.com
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Wednesday, August 24, 2022 9:02:58 AM

Greetings,

I encourage you to discard this addendum. The preservation of the littoral ecosystem needs a healthy population of horseshoe crabs, and already we face dwindling numbers of them. The harvesting of breeding ready females is added insult to the already damaging effects of global warming, rising water temperature and nitrogen fueled oxygen depletion of our estuaries. It is clearly time to minimize disruption of horseshoe crab stocks until they rise back up to sustainable levels.

**Thank you,
Philip W. Romano**

**3316 149th Place,
Flushing NY 11354
(917) 561 9426**

From: [Ramona Gault](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Sunday, September 4, 2022 2:53:01 PM

Dear Ms. Starks,

The Atlantic marine fisheries commission has proposed a change in the rules governing the protection of horseshoe crabs. They want to allow the “ harvesting” of female horseshoe crabs. Scientists say the horseshoe crab population is already dangerously low. And the shorebird population that feeds upon their eggs is also dangerously depleted.

Synthetic substances are available now and widely used outside the US to replace horseshoe crab blood for medical uses. It is not necessary to harvest horseshoe crab blood. Also, using horseshoe crabs as bait is a short-sighted, unnecessary practice that threatens the ecological integrity of shorelines, including the survival of red knots. I oppose the fisheries’ change of policy and urge them to vote no to horseshoe crab addendum VII.

Thank you.

Ramona Gault

From: [Zinnia Cardamomum](#)
To: [Comments](#)
Subject: [External] In support of red knot protection
Date: Friday, September 2, 2022 8:50:05 PM

Greetings!

We are a mother and father who support safeguarding both horseshoe crabs and the red knots who depend upon them. We don't want to take any risks with the possible extinction of red knots.

In the 1980s, about 90,000 red knots were counted each spring along their Delaware Bayshore stopover. Horseshoe crab harvesting exploded in the 1990s, going from an annual harvest of 100,000 in 1991 to 2.5 million by 1998. Horseshoe crab populations crashed and, in turn, red knot numbers plummeted to about 13,000 birds in the mid-2000s.

After New Jersey's moratorium went into effect, the situation seemed to slowly improve, with more than 30,000 red knots counted in 2018 and 2019. But the population dropped sharply again, with only 6,800 red knots counted in 2021 and 12,000 this year.

The reasons behind the recent low numbers aren't fully understood, but to Dillingham they unequivocally point to a need to do everything possible to protect the birds.

"We know that red knot numbers are so depleted that they're listed as threatened," he said. "We don't want to take any risks we can avoid. One way we can protect them is to not allow harvests of horseshoe crabs, because they provide the eggs the birds need."

Female crabs need to be so abundant that they cover the beach and accidentally dig up other nests while depositing their own eggs. The eggs that are disturbed by successive waves of nesting female crabs float along the beach, becoming the food supply that powers the birds' migration. It makes no biological sense to harvest female crabs until excessive crab eggs and birds return to their 1980s density.

Thank you for your time and consideration and thank you for protecting the beautiful wildlife we share the world with. Rebecca

From: [Caitlin Starks](#)
To: [Comments](#)
Subject: FW: [External] Comments on ASMFC draft addendum-Crab Fishery Plan
Date: Friday, September 30, 2022 9:10:06 AM

From: pibe1205 <pibe1205@aol.com>
Sent: Thursday, September 29, 2022 9:09 PM
To: Caitlin Starks <cstarks@asmfc.org>
Subject: [External] Comments on ASMFC draft addendum-Crab Fishery Plan

Dear Ms Starks-

Please reconsider implementation of plan ref killing more Horseshoe Crabs.

If Her Deepness Dr Sylvia Earle recommends protection of this species, Horseshoe Crabs, why can we follow her exceptional scientific and humanistic view on this issue.

Sincerely,

Pilar B Stack

[Sent from the all new AOL app for iOS](#)

From: [Rebecca](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Friday, September 2, 2022 8:43:41 PM

Hi there!!

I am a young person who cares about protecting wildlife. I think that we don't want to take any risks with the possible extinction of red knots.

In the 1980s, about 90,000 red knots were counted each spring along their Delaware Bayshore stopover. Horseshoe crab harvesting exploded in the 1990s, going from an annual harvest of 100,000 in 1991 to 2.5 million by 1998. Horseshoe crab populations crashed and, in turn, red knot numbers plummeted to about 13,000 birds in the mid-2000s.

After New Jersey's moratorium went into effect, the situation seemed to slowly improve, with more than 30,000 red knots counted in 2018 and 2019. But the population dropped sharply again, with only 6,800 red knots counted in 2021 and 12,000 this year.

The reasons behind the recent low numbers aren't fully understood, but to Dillingham they unequivocally point to a need to do everything possible to protect the birds.

"We know that red knot numbers are so depleted that they're listed as threatened," he said. "We don't want to take any risks we can avoid. One way we can protect them is to not allow harvests of horseshoe crabs, because they provide the eggs the birds need."

Female crabs need to be so abundant that they cover the beach and accidentally dig up other nests while depositing their own eggs. The eggs that are disturbed by successive waves of nesting female crabs float along the beach, becoming the food supply that powers the birds' migration. It makes no biological sense to harvest female crabs until excessive crab eggs and birds return to their 1980s density.

Thanks for your time and consideration.

Take care,
Rebecca

From: [Rhonda Anderson](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Tuesday, September 6, 2022 7:08:56 PM

Hello,

I am against the raising of quotas on the killing of horseshoe crabs, either for their use as bait or their use in the pharmaceutical industry. In these times of declining numbers and increased environmental stress, it seems unbelievable that this is even being considered.

Thank you,
Rhonda Anderson

From: [Rich Venuti](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Tuesday, August 23, 2022 9:06:10 PM

- The ASMFC must provide the modelling and analysis which justifies the expansion of the harvest of female horseshoe crabs for the public to review.
- The ASMFC should ensure that the original safeguards in their harvest policies prohibiting female horseshoe crabs from being harvested until Red Knot numbers recover are included in any new policies.

Please keep the current limits in place, especially the zero harvest of female crabs. Thank you!

From: [Richard Harvey Swaine](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Thursday, September 29, 2022 3:49:06 PM

To Caitlin Stacks & the ASMFC:

I have read the Draft Addendum VIII to the Horseshoe Crab Fishery Mgmt Plan. I came away from this document feeling some alarm, feeling convinced that a decision to permit the harvesting of female horseshoe crabs has already essentially been made and that there's little the public at large can do to stop it.

Be that as it may, I would like to go on record and protest such a step; the harvesting of these crabs should be halted until, at the very least, populations return to historic levels. The crabs themselves and the birds that depend on their eggs are an essential part of our natural heritage and should be protected.

With the underlying data supporting the new draft addendum kept secret, how can the public not assume the worst? How can the public comment on a proposal when you are not releasing the data supporting the types of increases being proposed? With both Red Knots and horseshoe crabs at historically low numbers it would be lunacy to proceed.

As you well know, Red Knot populations are at historic lows. In the 1990s, more than 90,000 could be found along Delaware Bay. This year, only 12,000 were counted, and in 2021, the number was estimated at an all-time low of 6,800. Evidence is now emerging that Red Knots are bypassing the Delaware Bay stopover altogether in search of life-sustaining food sources elsewhere. This makes their migratory journey all the more perilous.

The killing of female horseshoe crabs all but assures that their population levels will never rebound. This is an awesome responsibility for any group of human beings to take. To knowingly risk the elimination of these creatures, the crabs and the birds dependent upon them, is a choice nobody should be willing to make.

Thank you.

Richard Harvey Swaine
55 Cleveland Avenue
Highland PARK, NJ 08904

(732) 322-6744

From: [Richard Price](#)
To: [Comments](#)
Cc: [Erin Nicklow](#); [Ian Price](#); [Tom Price](#); [Holly Preputnick](#)
Subject: [External] Opposition to The Atlantic States Marine Fisheries Commission's Proposal to Allow the Increased Taking of Horseshoe Crabs
Date: Sunday, September 18, 2022 9:12:56 AM

Dear Administrators:

As a frequent angler and birder who fishes and birds in the Delaware Bay vicinity, I would like to express my opposition to the proposal to allow the increased taking of Horseshoe Crabs. I believe based on scientific data that your proposal will further endanger the vital existence of several bird species like the Red Knot, which depend on the eggs of this invertebrate for sustenance during their long and exhausting migrations.

These birds have survived for millennia based on an adequate supply of nourishment provided by the Horseshoe crabs. Their existence depends on a delicate balance and your current proposal would upset that balance. Please do the right thing and protect the interest of these invertebrates and the creatures that depend on them. Do not put commercial gains ahead of conservation of species at a time of great need for the environment.

Thank you for your attention to this matter.

Sincerely,

Richard D. Price, Ed. D.
7293 Olde Mill Road
Harrisburg, PA 17112

From: [R. Peter Mogielnicki](#)
To: [Comments](#)
Subject: [External] Horseshoe crab
Date: Tuesday, August 16, 2022 3:22:27 PM

Dear Commission members,

I write in favor of continuing the ban on harvesting female horseshoe crabs.

As I am sure you know, horseshoe crab eggs are a critical source of calories, fat and nutrition for migrating shorebirds. I participated in a breeding horseshoe crab survey in Rhode Island this spring and early summer and virtually the only places I observed shorebird activity along the shores of our coastal lagoons were places where there was evidence of recent horseshoe crab mating activity.

Shorebird populations are far from stable. Red knots, in particular, are experiencing a dramatic decline largely due to poor nutrition during their northward migration which is known to be largely dependent on a rich supply of horseshoe crab eggs. During our surveys, we saw many instances of a female crab being pursued by multiple males so it is the female crabs that seem to be in short supply. And as far as I know, female horseshoe crabs are the only ones that lay the eggs!

One final point. As far as I know, there is little data about how young horseshoe crabs fit into the diets of multiple marine fish. Maximizing their numbers by banning the harvest of female crabs is important for all sorts of reasons.

Thank you very much,

Sincerely,

Robert Peter Mogielnicki
26 Dowd Drive, Charlestown, RI 02813
and
3741 NE 35th Avenue, Portland, Oregon, 97212
Cell (860)869-8766

From: mark_miano@everyactioncustom.com on behalf of [Richard Miano](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Friday, September 30, 2022 11:57:42 PM

Dear Atlantic States Marine Fisheries Commission,

As a supporter of birds and the places they need to thrive, I am writing to strongly oppose the Atlantic States Marine Fisheries Commission's (ASMFC) proposed Addendum VIII Interstate Horseshoe Crab Fishery Management Plan, which increases the number of horseshoe crabs harvested for use as bait and reopens the harvest to include female horseshoe crabs.

The decline in horseshoe crab populations is concerning along the Atlantic Coast. It is especially important along the Delaware Bay, given its importance as a horseshoe crab spawning area and important stopover point for migrating red knots. Several indicators show that both horseshoe crab populations and the population of red knots, which depend their eggs as a source of food, are well below recovery thresholds.

I urge the commissioners to vote no on Addendum VIII for the following important reasons:

1. Horseshoe crab populations remain at historic lows, and their ongoing use both for bait threatens their ability to recover to their historic population levels.
2. Red knot populations are at all-time lows from both climate change and increasing scarcity of the food needed to fuel their 9,000-mile migration.
3. There are alternatives to using horseshoe crabs for the bait industry
4. Nature-based tourism and associated economic activity in the coastal Mid-Atlantic region is vital to local economies that depend on healthy ecosystems and the abundance of horseshoe crabs and the red knot

It is concerning that the proposed revision would likely trigger a resumption in the harvest of female horseshoe crabs, which would make recovery of the species virtually impossible. Under the current ASMFC framework, there is no female crab harvest until female abundance reaches 11.2 million crabs or until the Delaware Bay total red knot stopover population reaches 81,900 birds. Neither red knot nor horseshoe crab populations are anywhere close to satisfying either metric, nor yet, under this addendum, female harvest could be allowed.

The joint collapse of red knots and horseshoe crabs is not inevitable. However, the draft addendum propels them closer to that grim reality. I urge you to vote no on Addendum VIII in order to protect the red knot and the places they need to survive, protect healthy ecosystems in the Delaware Bay, and to support local economies dependent on nature-based tourism that is such a critical component of the communities surrounding the Delaware Bay.

Sincerely,
Mr. Richard Miano
4413 Lowell St NW Washington, DC 20016-2748
mark_miano@hotmail.com

From: [Rob Wilson](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Sunday, September 11, 2022 4:01:01 PM

Did I read this correctly? This addendum is to RAISE?? the limit on horseshoe crab harvest? For bait?? Are you kidding me? There should be no harvest whatsoever until crab and bird populations rebound. There are a multitude of viable alternatives. Please reconsider this reckless and harmful proposal.

Thanks,

Rob Wilson

From: [Robert Graffin](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Protection
Date: Friday, September 16, 2022 8:34:48 AM

Hello,

Please do NOT allow harvesting of horseshoe crabs per the proposed update to regulations. I urge you to REJECT the new proposal and to continue to protect this species.

Sincerely,
Dr. Robert Graffin

From: [Ron V Marino](#)
To: [Comments](#)
Subject: [External] horseshoe crabs
Date: Tuesday, August 16, 2022 5:02:20 PM

Please do not allow overfishing of these creatures. They have been in decline since I first met them years ago!

Dr Ronald Marino

Sent from [Mail](#) for Windows

From: [Sallie McElrath](#)
To: [Comments](#)
Subject: [External] Crabs, Red Knots
Date: Tuesday, September 27, 2022 7:32:51 AM

Dear Atlantic States Marine Fisheries Commission,

Proceeding with the implementation of the 2021 Adaptive Resource Management Framework Revision would be detrimental to red knots and a host of other species that rely on horseshoe crab eggs to fuel their migration.

Horseshoe crabs are on nature's oldest mysteries. They are hard and scary looking but completely harmless. Red Knots are beautiful migrating birds that have co-existed with the crabs for a very long time. Please do not put them more at risk with this new framework. Protect female horseshoe crabs. No bait!

Barring a full moratorium on horseshoe crab harvest, Option A under section 3.0 (Management Options) would be preferable to either possibility of Option B.

Regards,
Sallie McElrath
from Hyattsville MD and a frequent visitor to Delaware for birding

From: [Salome Ward](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Friday, September 2, 2022 2:52:22 AM

To Whom It May Concern:

Horseshoe crabs are a vital species for the ecosystem and contribute to the survival of multiple species including the threatened red knot sandpiper. The current ASMFC model takes into account the link between horseshoe crab eggs and the survival of the red knot. The proposed addendum undercuts this connection and removes protection for female horseshoe crabs which is unacceptable. The population of red knot sandpipers and horseshoe crabs has not recovered nearly enough as per current ASMFC guidelines. Any addendums should be to strengthen recovery and preservation of both species, not weaken it.

Horseshoe crabs are modern day prehistoric creatures. It would be a travesty for them to meet their demise due to our careless over-harvesting, which would also seal the fate of the red knot. Please do not adopt the Draft Addendum VIII.

Sincerely,
Salomé Ward
Westfield, NJ

Sent from my iPhone

From: [Royden Saah](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Thursday, September 15, 2022 11:22:43 PM

Dear Dr. Starks and Atlantic States Marine Fisheries' Commission,

PLEASE VOTE NO on Addendum VII –

I am a medical diagnostic microbiologist who has strengthened the entire Guyana Public Health Laboratory Network, managed emergency response teams in the North Carolina State Public Health Laboratory, and lead the Doctors Without Borders effort to build an Ebola resistant hospital for children in Liberia during the 2014-2015 West African Ebola Epidemic and evaluated CDC in improvement efforts around emergency testing response.

Except for brief stints for COVID response(with WHO and private practice), I now work in the field of biotechnology for use in conservation. I am concerned about the continued reliance of a product (horseshoe crab blood) that unnecessarily impacts both crab populations and the ecosystems in which these crabs have evolved. The use of synthetic products, whenever possible, will decrease pressures on ecosystems in general and assist in the recovery of vulnerable shorebird populations, such as the Red Knot. In this case, synthetic products are available as an alternative to crab blood.

Again, I urge you to vote no and allow the market to use sustainable products for medical diagnostics whenever possible.

With Appreciation,
Royden Saah

J. Royden Saah (he/him)
GBIRd Program Coordinator
[Genetic Biocontrol of Invasive Rodents Program](#) (GBIRd)
[Island Conservation](#)
Skype: roydensaah
Phone: +1 919 520-5954

From: [Russ Falardeau](#)
To: [Comments](#)
Subject: [External] Horseshoe crab draft addendum VIII
Date: Sunday, September 18, 2022 9:06:51 PM

From Russ Falardeau, West Wareham MA

Copy from: Horseshoe Crab Recovery Coalition.

The Horseshoe Crab Recovery Coalition strongly opposes the Atlantic States Marine Fisheries Commission's (ASMFC) plan to change its Horseshoe Crab Fishery Management Plan, a move that would raise quotas on the killing of horseshoe crabs for use as bait by potentially reopening the harvest to include female horseshoe crabs. ● We remain concerned that the underlying data supporting the new draft addendum to the plan has still not been released to the public, so that conservation groups and concerned citizens have no way to truly understand the science on which the new proposal is based. ● Under the current framework there is no female crab harvest until female abundance reaches 11.2 million crabs or until the Delaware Bay total red knot stopover population reaches 81,900 birds. The proposed revision would allow the resumption of the female harvest, even though neither the red knot nor female horseshoe crabs of Delaware Bay are close to satisfying either metric. ● How can we comment meaningfully on a proposal when you are not releasing the data supporting the types of increases being proposed? With both red knots and horseshoe crabs at historically low numbers, we cannot take the commission's assertions on faith. ● Based on field work, including egg density studies conducted by the Delaware Bay Shorebird Project and other organizations, we do not believe that horseshoe crab populations are recovering from their population crash in the 1990s. Egg density data is the most reliable indicator of the horseshoe crab population, and importantly, it is the most reliable index of value for red knots and other shorebirds. Yet ASMFC has never included these surveys in its modeling. Making matters worse, ASMFC also does not include field survey data for Red Knots, and these show that Red Knot populations are at historic lows. In the 1990s, more than 90,000 could be found along Delaware Bay. This year, only 12,000 were counted, and in 2021, the number was estimated at an all-time low of 6,800. Evidence is now emerging that Red Knots are bypassing the Delaware Bay stopover altogether in search of life-sustaining food sources elsewhere. This makes their migratory journey all the more perilous. ● Shorebirds like the red knot are plummeting toward catastrophe, with their declines representing the world's number one conservation crisis facing birds today. And the killing of female horseshoe crabs all but assures that their population levels will never rebound. ● The joint collapse of red knots and horseshoe crabs is not inevitable. But this proposal propels them closer to that grim reality.

My Comments:

Please Please do all you can to protect the horseshoe crabs including keeping the prohibition of harvesting female horseshoe crabs in Delaware. This prohibition (not to harvest of female crabs) should be applied to the whole east coast. Through the 50s to 90s horseshoe crabs were abundant. You would see everytime you went to shoreline. The shoreline would be littered with sheds. When I walk on a tidal flat I would always see horseshoe crab tracks. Today see a horseshoe crab is a real treat, we just don't see them. I don't find any sheds either.

Horseshoe crabs are really in trouble. We have no understanding of the role they play in the ecosystem. We used to have crystal water in the bay and abundant eel grass. The eel grass decline began at same time commercial harvesting horseshoe crabs began. Is the eel grass scarcity due to removing horseshoe crabs from the ecosystem?

Why are we even allowing the commercial harvest of horseshoe crabs, just to make a few men rich. Remember rich men die other rich men take the place, but once the horseshoe crab is gone it is gone forever. Remember the Passenger Pigeon.

Thanks for listening

Russ Falardeau

From: [Ruth MacNutt](#)
To: [Comments](#)
Subject: [External] Horseshoe crab harvest
Date: Thursday, September 29, 2022 3:51:43 PM

I am against raising the quota
Ruth MacNutt
ruth.macnutt@gmail.com

From: [sam zappala](#)
To: [Comments](#)
Subject: [External]
Date: Sunday, September 11, 2022 12:07:38 PM

Sent from [Mail](#) for Windows

Because of the GREED of humans; species are dying out. As a result of Earth's condition; no lives will exist.

WAKE-UP.

From: [Sandra A. Unger](#)
To: [Comments](#)
Subject: [External] Horseshoe crabs
Date: Sunday, September 11, 2022 4:51:29 PM

I vehemently oppose relaxing limits on horseshoe crab harvesting.

From: [Scott S](#)
To: [Comments](#)
Subject: [External] Moratorium on Taking Female Horseshoe Crabs for Fish Bait.
Date: Wednesday, September 7, 2022 7:55:53 AM

Please do not Lift the Moratorium on Taking Female
Horseshoe Crabs for Fish Bait.

Scott Scheidt
Paoli, PA

Sent from my iPhone

From: [Sandra Folzer](#)
To: [Comments](#)
Subject: [External] No harvesting of female horseshoe crabs
Date: Friday, September 2, 2022 9:12:28 AM

Please do NOT allow harvesting of female horseshoe crabs. Horseshoe crabs have been around since prehistoric times and they are important for our environment, such as providing food for birds. Already we abuse them terribly for medical research since many die after their blood has been taken. No more injuries to these important marine specimens.

Please.

Sincerely,

Dr. Sandra Folzer
209 Rex Ave
Philadelphia, PA 19118

From: [Scott Chelemer](#)
To: [Comments](#)
Subject: [External] Re: Horseshoe Crab harvest
Date: Monday, September 12, 2022 10:59:39 AM

From: Scott Chelemer
Sent: Monday, September 12, 2022 10:42 AM
To: comments@asmfc.com <comments@asmfc.com>
Subject: Horseshoe Crab harvest

Dear Madam or sir,

I am writing to ask you to re-consider and in fact cancel your plan to increase the harvest allowance of horseshoe crab eggs in and around the Delaware Bay. I, along with hundreds of other birders, visit Cape May and Cumberland County annually to observe the spring shorebird migration, in particular the Red Knot flight. Increasing the harvest of an already depleted population of horseshoe crabs would further cripple the Knot population, and ultimately may cost the bird its NJ existence! This will also have an impact on the Cape May county economy, as we stay in hotels, dine in restaurants, and shop while we are in the area.

I am also sending a copy of this letter to Hon. Rep. Jeff van Drew, who I believe represents the pertinent area around the Delaware Bay.

Yours sincerely,

Scott B. Chelemer, MD
Mount Laurel, NJ

From: [Sharon Rothe](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Tuesday, August 23, 2022 10:43:07 AM

Horseshoe Crabs are in danger of going extinct because of overfishing. They should be protected. They are part of our circle of life. Please support the Horseshoe Crab Addendum VIII. Too many of our species are disappearing because of industrial greed.

S. Rothe

Sent from my iPhone

From: [Sondra Wolferman](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Monday, August 22, 2022 11:52:34 AM

Dear Commissioners:

Horseshoe crabs play an essential role in the ecology of coastal communities and as such should be managed with the goal of sustaining healthy horseshoe crab populations and protecting the ecosystems upon which they, and many other marine animals, rely for survival.

Commercial fisheries using horseshoe crabs as bait for catching snails and eels must face the reality that horseshoe crabs are a finite resource whose numbers are dwindling throughout much of their range. Researchers have been working on alternative baits that are currently available to the industry. Furthermore, the market for snails and eels in the United States is relatively small, suggesting that a large portion of the catch is being exported to overseas markets, mainly Europe and Japan, leaving our coastal communities to deal with the ecological damage caused by over-harvesting of horseshoe crabs for commercial interests in the Delaware Bay and elsewhere in the mid-Atlantic region.

Likewise, the harvesting of horseshoe crabs for use in biomedical research is an antiquated practice that is no longer relevant given the alternatives to animal testing currently available to the science community. Researchers who are up to date in their fields are moving away from cruel and inhumane animal experiments toward non-animal methods that include sophisticated tests using human cells and tissues (in vitro methods), advanced computer-modeling techniques, and studies with human volunteers. A high-ranking former official with the U.S. National Institutes of Health has described experimenting on animals to help humans as “a major failure”, such experiments being generally inapplicable, and in some cases harmful, to humans.

Horseshoe crabs have survived on this planet for hundreds of millions of years and deserve better than to be exploited for cruel and unnecessary medical procedures or as fish bait to support an industry that services mainly foreign markets at the expense of our local marine environments.

The annual migration of horseshoe crabs along the Atlantic coastline is a miracle of nature enjoyed by thousands of spectators in the mid-Atlantic region every spring. Let us not be the generation that drives this ancient species closer to extinction.

Thank you for the opportunity to comment.

Sondra Wolferman

Albrightsville, PA

From: [yaedescott](#)
To: [Comments](#)
Subject: [External] Horseshoe Crabs draft addendum viii
Date: Monday, August 29, 2022 3:44:44 PM

ASMFC,

Please don't change the current policy to protect the prehistoric and important survival of the horseshoe crabs. It was agreed that the prohibition on harvesting female horseshoe crabs would not be lifted until the Delaware Bay region hosts at least 81,900 Red Knots or 11.2 million female horseshoe crabs.

Neither of these scenarios has occurred, yet the ASMFC proposed changes would result in lifting the prohibition on harvesting female horseshoe crabs, further imperiling the food supply for the remaining Red Knots.

This is coming at a time when Red Knot population is far from stable. The average Red Knot count at Tierra del Fuego for [2018-2020](#) declined more than 75 percent from average counts in the 1980s and 2000. In 2021, only 6,800 Red Knots were counted, which is by far the lowest count since surveys began.

Scott yaede lower Raritan Watershed Association

Sent from my Galaxy

From: [Shannin Zevian](#)
To: [Comments](#)
Subject: [External] Please Bin Amendment VIII : Horseshoe Crab Management Plan
Date: Sunday, September 25, 2022 4:24:25 PM

This proposal seems completely absurd. I'm having trouble believing this is even a discussion that needs to be had. The Atlantic States Marine Fisheries Commission should reject any proposed management of horseshoe crabs that would lead to the increase in harvest of horseshoe crabs, especially if those increases includes the harvest of female horseshoe crabs.

Under the existing management framework, the commission has said that it would not allow harvest of female horseshoe crabs unless the crab population was 11.2 million crabs or the threatened rufa red knot stopover population reached 81,900 birds. Neither threshold has been met, and yet the commission is insisting on changing the population modeling that would allow a harvest increase, including the first harvest of female horseshoe crabs in decades. This makes no sense!

With red knot counts of 12,000 birds this year, up from only 6,800 last year, it defies logic that the horseshoe crab harvest should increase. More worrisome is that the public has yet to see the full details of the scientific model that justifies this harvest increase.

I hope the commission will toss Amendment VIII straight into the bin. At the very least; share the full scientific details of the model with the public & include other scientific data sources such as horseshoe crab egg density and red knot aerial surveys into the model before recommending any changes to harvest.

Thank you for your time,
Shannin Zevian, PhD

From: [Stephanie Myers](#)
To: [Comments](#)
Subject: [External] Do Not Expand Harvest on Horseshoe Crabs
Date: Wednesday, September 14, 2022 10:34:34 AM

The red knot population is not stable. Let's not put another nail in their coffin by making it harder for them to refuel during their migration. The average red knot count at Tierra del Fuego for 2018-2020 declined more than 75 percent from average counts in the 1980s and 2000. In 2021, only 6,800 red knots were counted, which is the lowest count since surveys began. Allowing female horseshoe crabs to be harvested will jeopardize the crab population, the Bay ecosystem, and the shorebird populations that are already stressed. NO expansion is the responsible way to go. Don't give in to corporate mentality.

From: [Susan Giaccone](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Sunday, September 25, 2022 9:04:11 PM

Please keep your current policy protections for female horseshoe crabs in tact.

Using horseshoe crabs for bait is not worth the risk. Female horseshoe crabs should not be harvested.

Thank you.

From: [susan.kassin](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Tuesday, August 23, 2022 5:01:13 PM

To Caitlin Starks or Whom It May Concern:

The fragile and unique ecosystem of the Delaware Bay is at risk due to the over-harvesting of horseshoe crabs.

I strongly oppose the Atlantic States Marine Fisheries Commission's proposal that would endanger Delaware Bay horseshoe crabs and the migratory shorebirds which depend on them.

Lifting the prohibition on harvesting female horseshoe crabs is a dangerous mistake. We lose these vital creatures at our own peril. Horseshoe crab blood is invaluable to medical science. In addition, the horseshoe crabs are the lifeblood for the migrating Red Knots arriving from South America.

These species are in danger of extinction, and we really need to question our priorities. Once these creatures are gone, that finality will be devastating and deadly. And the truth is that it does not have to be this way.

PLEASE DO NOT APPROVE THE HARMFUL PROPOSAL OF LIFTING PROHIBITIONS ON THE KILLING OF FEMALE HORSESHOE CRABS.

Thank you, and Sincerely,

Susan Solomon

Saint Paul, MN

From: [Stewart Rosen](#)
To: [Comments](#)
Subject: [External] OPPOSED - Horseshoe Crab Draft Addendum VIII
Date: Tuesday, August 23, 2022 10:38:00 AM

To whom it may concern:

I vehemently oppose your proposed amendment allowing increased harvesting of horseshoe crabs by the bait and biomedical industries which will put a severe strain on the ecological connection between horseshoe crabs and shorebirds like the threatened Red Knot. Although the Red Knot population is perilously low, the ASMFC has proposed allowing the harvest of female horseshoe crabs, whose eggs provide the food that fuels the final leg of the birds' journey to Arctic nesting grounds.

Stewart Rosen
210 5th Street, Unit
Hoboken, NJ 07030
917-923-9995

From: [Comments](#)
To: ["delawareaudubon@gmail.com"](mailto:delawareaudubon@gmail.com)
Cc: [Caitlin Starks](#)
Subject: RE: [External] Re: ASMFC extreme overreach
Date: Monday, August 29, 2022 10:31:53 AM

Thank you for providing input on Draft Addendum VIII to the Interstate Fishery Management Plan for Horseshoe Crab. Your comments will be shared with the Horseshoe Crab Management Board for consideration at the next Board meeting, which will likely occur this Fall. Upon considering public input, the Board will select final management measures and consider final approval of Addendum VIII.

[Caitlin Starks \(she/her\) | Senior Fishery Management Plan Coordinator](#)

Atlantic States Marine Fisheries Commission

1050 N. Highland Street, Suite 200 A-N

Arlington, VA 22201

Phone: 703.842.0740 | Fax: 703.842.0741

cstarks@asmfc.org | www.asmfc.org

From: Delaware Audubon <delawareaudubon@gmail.com>

Sent: Friday, August 26, 2022 6:51 AM

To: comments@asmfc.org

Subject: [External] Re: ASMFC extreme overreach

The attached photo shows the only Red Knot seen at Mispillion Harbor on May 15, 2022, which under previous conditions was the approximate peak of the Red Knot stopover at that location. The charismatic Red Knot is now bypassing the Delaware Bay because the continuing horseshoe crab harvest has disrupted the Bay's delicate natural balance, resulting in a dearth of horseshoe crab eggs on the beach when they are needed by the Red Knot. The scarcity of horseshoe crab eggs has increased the hazard of the Red Knot's epic migration, putting the rufa subspecies at increased risk of extinction.

Delaware officials need to acknowledge that the "Adaptive Resource Model" of the Atlantic States Marine

Fisheries Commission, on which the state has been basing its horseshoe crab policy, has not been achieving the model's stated design of Red Knot protection. Because the Delaware Bay horseshoe crab harvest has continued uninterrupted, the Red Knot is showing no signs of recovery from the catastrophic period of [horseshoe crab overharvest of the 1990s](#). The [same interests](#) that were behind that disaster are now making the cavalier proposal for a [further expansion of the harvest](#).

Based on actual observations rather than controversial computer model estimates, extinction of the rufa subspecies is now an imminent possibility unless responsible and resolute action is taken by Delaware public officials.

It was a mistake that-the State of Delaware did not implement a horseshoe crab harvest moratorium in 2014 when the Red Knot was listed as Threatened under the Endangered Species Act. That oversight needs immediate correction. Delaware must implement a full bait harvest moratorium, consistent with the [one in place in New Jersey](#), until the Red Knot is removed from Endangered Species Act protection. The fishing industry will not face adverse consequences once the take of horseshoe crabs is prohibited, since there are alternatives to using horseshoe crabs as bait for eel and whelk.

The horseshoe crab bait harvest moratorium must be a priority issue for the 2023 Delaware legislative session. Delaware officials will be recognized worldwide as

environmental champions if they have the courage to take the necessary action to prevent the iconic Red Knot from sliding to extinction. They must also keep in mind that if inaction results in the demise of the Red Knot, there is no reset button.

[New York Times - Red Knots in Steepest Decline in Years, Threatening the Species' Survival](#)

Steve Cottrell
President, Delaware Audubon Society

On Sun, Aug 14, 2022 at 8:32 AM Delaware Audubon <delawareaudubon@gmail.com> wrote:

It is astounding that the ASMFC is now considering recommending increasing the take of an essential food source of a shorebird listed as [Threatened under the Endangered Species Act](#). The Red Knot was listed as Threatened by the U.S. Fish and Wildlife Service in 2014 and is showing no visible signs of recovery. The same fishing interests that caused the population crash of the Red Knot in the 1990s are now proposing to expand the slaughter of horseshoe crabs to include females, based on numbers generated by its new Adaptive Resource Management model. The model's rosy numbers regarding the Red Knot population are in sharp contrast to numbers from the field which indicate the Red Knot's status remains precarious.

It is perplexing that the model does not take into account the wild card climate variable, which suggests that the proponents of the new model are deliberately

choosing to ignore the implications of climate change. Perhaps the proponents of the new model are unaware that the extinction of the Carolina Parakeet and the Passenger Pigeon occurred very rapidly, and that a single extreme climate event befalling a species that is barely hanging on will push it over the edge.

It is obvious that the ASMFC committed considerable resources to the development of its new model. While the major greenhouse gas emitting nations are in the process of retooling to convert from using fossil fuels to using renewable energy sources, it is peculiar that the ASMFC is not making any evident effort to investigate converting from the primitive practice of butchering a finite natural resource for use as bait to using a less environmentally destructive bait source. Likewise, the horseshoe crab bleeding industry in the United States is resisting efforts to convert from the now-antiquated, barbaric practice of bleeding *Limulus* for bacterial endotoxin testing to the use of the equivalent synthetic rFC, holding the United States behind Europe, where rFC was endorsed by the [European Pharmacopoeia](#).

As Mr. Roy Miller of Delaware pointed out at the [August 3 meeting](#) of the Horseshoe Crab Management Board, states are not obligated to adhere to the recommendations made by the ASMFC in determining their horseshoe crab harvest policies. Indeed, Delaware's legislators have wider concerns beyond the interests of a small number of horseshoe crab fishermen, and are expected to base state policies on sound economic and environmental reasoning. We look forward to working with Delaware's

legislators in the hope that a horseshoe crab bait harvest moratorium matching New Jersey's will be enacted and implemented until the Red Knot is removed from Endangered Species Act protections. Hopefully by then, alternatives to using the horseshoe crab for bait and endotoxin testing will become standard practice so that the Delaware Bay's ecological balance can be restored.

[Delaware's horseshoe crab policy is in urgent need of reform](#)

Steve Cottrell
President, Delaware Audubon Society

From: [Tari Pantaleo](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VII
Date: Monday, September 5, 2022 8:50:37 PM

For countless millennia, horseshoe crabs living in the Delaware Bay have played a vital role in the life cycles of migrating shorebirds, like the red knot, a sandpiper that can migrate 9,000-plus miles--from the tip of Tierra Del Fuego in South America to the Arctic tundra in Canada. The red knot depends on the nutrient-rich horseshoe crab eggs along the Delaware Bayshore to double their body weight and gain enough strength to complete their journey to nest and raise young in the north.

In the 1990s, horseshoe crabs were over-harvested as bait, leading to dramatic drops in crab and red knot populations. Red knots are now listed as threatened under the federal Endangered Species Act.

Since 2008, New Jersey has tried to protect red knots by imposing a moratorium on harvesting horseshoe crabs for bait in state-controlled waters. However, they can still be taken for their blood, which contains a chemical used by the biomedical industry.

Although New Jersey bans the harvest of horseshoe crabs for bait within state-controlled waters (three miles or less from the shoreline), there are no limits beyond the three-mile mark. As a result, trawlers from many nearby states capture horseshoe crabs off the New Jersey coast. Even on the Delaware side of Delaware Bay, fishermen can still legally harvest male horseshoe crabs as bait.

This already-difficult situation for horseshoe crabs and red knots could be made more perilous by a rule change proposed by the Atlantic States Marine Fisheries Commission (ASMFC), which is proposing to switch to a new scientific model for assessing horseshoe crab populations, one it claims is more accurate.

The new model would eliminate a longstanding policy decision not allowing the harvesting of any female horseshoe crabs until the populations of both crabs and red knots return to higher levels.

We don't want to take any risks with plummeting population of red knots. We should not be using horseshoe crabs for bait!

From: [Susie Miller](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Friday, September 30, 2022 5:50:40 PM

It just seems like common sense to not allow the harvest of female horseshoe crabs. With climate change and overdevelopment of our coastal environments directly impacting the decline of shorebird populations, you would think you would do everything to protect the female horseshoe crabs.

Instead I am writing this email to voice my opposition to amending the management plan to allow the harvest of female crabs.

When do we ever learn??

Susie Miller
PO Box 192
Ocean View DE 19970

From: john4photo@aol.com
To: [Comments](#)
Subject: [External] Horseshoe Crab increase
Date: Sunday, September 11, 2022 1:13:55 PM

Dear Sir or Madam,

I have learned that you are considering increasing the limit on the harvesting(killing) of horseshoe crabs. I am opposed as birds need the eggs. I live in south Jersey and can see the decrease in migratory birds caused by this.

Thank you for your consideration.

Terry Dailey from Mays Landing, NJ

From: [Terry Cooper](#)
To: [Comments](#)
Subject: [External] horseshoe crabs
Date: Sunday, September 11, 2022 11:51:08 PM

Hello,

I am writing in protest of increasing the harvesting of horseshoe crabs in the Delaware Bay. To increase the harvest of horseshoe crabs at this time, and likely for some time to come, would upset the balance of nature in that region. Red knots are becoming fewer and fewer. They are an important bird in the Delaware Bay region and are important in maintaining the natural food chain. To harvest more horseshoe crabs at this time would severely impact the number of red knots. At this time we can maintain some balance in the natural world and we should continue to do so in every area of life that we can.

Thank you,
Terry Cooper

From: [Timothy Russell](#)
To: [Comments](#)
Subject: [External] Horse shoe crab harvest limits
Date: Wednesday, September 28, 2022 11:19:06 PM

Please do not increase harvest limits for Horseshoe crabs. It is my understanding that the population numbers of these crabs are already diminished. It would be a shame if one more local animal disappears due to human activity.
Thank you
Tim Russell

Sent from my iPad

From: [AOL Customer Care](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Wednesday, August 24, 2022 11:38:44 AM

I oppose allowing horse shoecrab harving in Delaware Bay.
Theodora McCann

From: [Theodore Chase](#)
To: [Comments](#)
Subject: [External] Horseshoe crab draft addendum VIII
Date: Sunday, September 11, 2022 12:11:44 PM

I join NJ Audubon in opposing the Atlantic States Marine Fisheries Commission's (ASMFC) proposal to increase the harvest of horseshoe crabs, including a harvest of females for the first time in over a decade. It should be obvious that harvesting females will further decrease the horseshoe crab population, and will have a significant impact on the federally threatened Red Knot and other shorebirds that depend on horseshoe crab eggs during spring migration stopovers in Delaware Bay, putting them at risk of further population declines. Please, pay attention to the scientific data submitted by NJ Audubon showing that horseshoe crab populations and eggs are not increasing, and do not proceed with this change.

From: [Tom Ostrand](#)
To: [Comments](#)
Subject: [External] horseshoe crab Draft Addendum VIII
Date: Sunday, September 11, 2022 12:20:02 PM

I am strongly against the Atlantic States Marine Fisheries Commission's (ASMFC) proposal to increase the harvest of horseshoe crabs, including a harvest of females for the first time in over a decade. This action will have a significant negative impact on the federally threatened Red Knot and other shorebirds that depend on horseshoe crab eggs during spring migration stopovers in Delaware Bay, putting them at risk of further population declines.

Please do not remove the current prohibition of female horseshoe crab harvesting, and do not increase the limit on overall crab harvesting.

Thank you!

Thomas Ostrand
Metuchen, New Jersey

From: [Tom Mitchell](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Sunday, September 11, 2022 11:20:15 AM

I urge you to continue to protect the female horseshoe crabs from harvesting. Their population has not recovered and neither has the population of red knots, which are the existing requirements necessary to allow for the resumption of harvesting female horseshoe crabs. Please continue to maintain those requirements. Thank you.

From: [Tim Freiday](#)
To: [Comments](#)
Subject: [External] Horseshoe crab harvest
Date: Tuesday, September 13, 2022 1:39:59 PM

Hello,

Please do not increase the horseshoe crab harvest in the Delaware bay or open it to the harvesting of female crabs. The population of crabs is still too low to support this. There are less eggs available for the federally threatened red knot, whose populations are also way below historical levels. The phenomenon of migratory shorebirds in the region are a boon for the tourism industry on the Bay, bringing thousands of bird watchers to see the spectacle. We must maintain the population of crabs at a high enough level to support these birds or risk losing this spectacle for good. There are other baits that can be used for harvesting conch. Do not increase the harvest of horseshoe crabs.

Thank you,
Tim Freiday, M.S.

From: [Thomas Morris](#)
To: [Comments](#)
Subject: [External]
Date: Monday, September 12, 2022 10:26:57 AM

Please use common sense and do not increase the harvest of horseshoe crabs, especially the harvest of female crabs. Red Knots and other shorebirds need horseshoe crab eggs to complete their spring migration to the Arctic. Red Knot populations have been declining for years.

Thank you.

Tom Morris
197 Maplewood Ave, Milford, CT 06460

[Tom Morris](#)

From: [hogue](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Wednesday, September 28, 2022 4:11:05 PM

I am contacting you to ask you to please consider not allowing the harvesting of female horseshoes crabs. After moving to DE 6 years ago, I learned about the life and history of the horseshoe crab, including reading the book, Horseshoe Crab, Biography of a Survivor by Anthony D. Fredericks. I have participated in the annual horseshoe crab survey and spend countless hours walking the bay beaches "rescuing" or "flipping" the crabs and have called in numerous tags. I've witnessed the harvesting as well. I have so much respect for this creature who comes for an ancient ancestry here on Earth.

It seems to me that this amazing creature deserves better than what it's history and current demands upon it have been. It is a vital food supply for the migrating birds, including the endangered Red Knot. And of course, we process their blue blood for our medical needs. And we know that some die in that process. We use them as bait. Many perish on the beaches and particularly high numbers along Port Mahon Road, Little Creek because of the rocks that were placed there in attempts to control road flooding. Now you want to open up harvesting of the females (the EGG Layers) Of course the females are bigger, and they already struggle to survive when they are on their backs and can't get themselves flipped back over. Who among the harvesters if allowed to do so will not focus of collecting these bigger females over males. It could have a very negative impact of the female population, and the birds who rely on them for their eggs.

Please give the female horseshoe crab respect and every opportunity to thrive and do not open them up to harvesting.

Thank you,
Vickie Hogue

From: [Valerie Yefimova](#)
To: [Comments](#)
Subject: [External] Please maintain critical protections for horseshoe crabs.
Date: Monday, September 12, 2022 12:15:41 PM

- As a member of the Horseshoe Crab Recovery Coalition, New Jersey Audubon stands in strong opposition to the Atlantic States Marine Fisheries Commission's (ASMFC) plan to change its Horseshoe Crab Fishery Management Plan, a move that would raise quotas on the killing of horseshoe crabs for use as bait by potentially reopening the harvest to include female horseshoe crabs.
- Under the current framework there is no female crab harvest until female abundance reaches 11.2 million crabs or until the Delaware Bay total red knot stopover population reaches 81,900 birds. The proposed revision would allow the resumption of the female harvest, even though neither the red knot nor female horseshoe crabs of Delaware Bay are close to satisfying either metric.
- Based on field work, including egg density studies conducted by the Delaware Bay Shorebird Project and other organizations, we do not believe that horseshoe crab populations are recovering from their population crash in the 1990s. Egg density data is the most reliable indicator of the horseshoe crab population, and importantly, it is the most reliable index of value for red knots and other shorebirds. Yet ASMFC has never included these surveys in its modeling. ASMFC also does not include field survey data for Red Knots, and these show that Red Knot populations are at historic lows. In the 1990s, more than 90,000 could be found along Delaware Bay. This year, only 12,000 were counted, and in 2021, the number was estimated at an all-time low of 6,800. Evidence is now emerging that Red Knots are bypassing the Delaware Bay stopover altogether in search of life-sustaining food sources elsewhere. This makes their migratory journey all the more perilous.
- The joint collapse of red knots and horseshoe crabs is not inevitable. But this proposal propels them closer to that grim reality.

Thank you for your time and attention,

Valeriya Efimova

From: [Bill Maher](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Draft Addendum VIII
Date: Friday, September 30, 2022 9:41:09 PM

Dear ASMFC Regulators, How are you?

I hope that you will consider my letter arriving after 5pm on September 30, 2022.

I am sure you have heard that Horseshoe Crabs used to cover the Beaches of our Cape May Bayside during May!

Now 50 years later, in May you can actually count the Horseshoe crabs they are so sparse on our Bayside beaches.

Horseshoe Crabs have been around for 350 million years, that means that many Estuarine Ecosystems evolved on their watch.

It is very important to this Co-Evolution process, that I always noticed lines of muddy water when working in the bays.

Upon closer inspection, I saw that Horseshoe crabs were ploughing along the bottom feeding and churning up a cloud of things!

This churning up process

obviously provides nutrients, bacteria, diatoms, etc. to the Zooplankton that include the larvae of most of our commercial seafood! On up the Food Chain!

In the late 1970's, I provided local Horseshoe crabs to a Limulus Lysate research firm in North Jersey. It was at the beginning of a new and supposedly sustainable Lysate industry.

Today as a medical professional, I know that Pharmaceutical Science can now replicate any natural compound exactly, if they persist. A molecule might need to be left-handed instead of right-handed, and it costs money to find out! Thus, it might be cheaper to just use live Horseshoe Crabs. BUT! In the case of Horseshoe Crabs, and our Biosphere we have to be motivated to preserve all LIFE above the bottom line of costs, OR WE ARE DOOMED!

I would like your feedback too. I have had the experience of watching Horseshoe Crabs being ground for Conch Bait, on the dock at 956 Ocean Drive, Cape May.

I would like for ASMFC regulators to witness this process first hand before coming to a decision. There are other Conch and Eel baits. Also, a fish lure synthetic bait could possibly be twisted to attract conch, like Ant bait!

It is alarming that our local seafood resources have been decimated in my lifetime.

If the Estuary is to retain "Nursery of the Sea" status it will need the countless Horseshoe Crabs of the past to churn things up again!!

So please leave our big old momma Horseshoe crabs alone to keep our Estuaries churned up and fertile!

Sincerely yours,

William Maher,

BS. Marine Biology, plus graduate level: Ichthyology, Estuarine Ecology.

MA. DDS.

More important a Lifetime in and on the waters!

From: [Virginia Johnson](#)
To: [Comments](#)
Subject: [External] Horseshoe Crab Quotas
Date: Sunday, September 11, 2022 11:25:10 AM

Sirs. Please do not approve an increase of horseshoe crab quotas nor-the capturing /killing of female horseshoe crabs
It is imperative to their future that an increase not be allowed in the Bay. Thank you.

Virginia Johnson
Mountain Lakes NJ

Sent from my iPhone

From: [WENDY WALKER](#)
To: [Comments](#)
Cc: audubonconnect@audubon.org
Subject: [External] Horseshoe Crabs losing protection
Date: Wednesday, September 14, 2022 6:42:53 AM

As a worried supporter of our environment & Planet Earth, I am deeply concerned that undermining protection of our female horseshoe crabs & allowing fishermen to again use them for bait is going backward in a way that will have tragic consequences for their future.

Females are already being used with no oversight by pharmaceutical companies.

Research is too scant to continue to decimate HSC populations.

Please uphold ban & protect our future HSC populations.

Respectfully,

Wendy Walker

3020 Cedarville Rd.
Millville, Nj



Atlantic States Marine Fisheries Commission

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MEMORANDUM

TO: Horseshoe Crab Management Board
FROM: Horseshoe Crab Advisory Panel
DATE: October 21, 2022
SUBJECT: Advisory Panel Input on Draft Addendum VIII

Background

The Advisory Panel (AP) met on October 13, 2022 to review Draft Addendum VIII for public comment and the public input that has been submitted during the comment period. The AP members also provided input to the Board on the proposed management options. This memo contains the opinions of individual advisors and does not represent a consensus opinion.

Advisory Panel Attendance: Brett Hoffmeister (Associates of Cape Cod Inc.), Allen Bergeson (Lonza), Nora Blair (Charles River Laboratories), David Meservey (Fisherman/Dealer), Christina Lecker (Fuji-Wako), Benjie Swan (Limuli Labs), George Topping (Fisherman)

Public: Sarah Blick (Associates of Cape Cod Inc.)

AP Comments Draft Addendum VIII

Staff reviewed Draft Addendum VIII and then presented metrics regarding public comment. The majority of the public comment was determined to be against moving forward with Addendum VIII and was largely compromised of eight separate form letters, though there were other individual comments.

The letters contained generalized statements about horseshoe crab and red knot populations such as “has not recovered” and “continued decline.” Some presented data that are not consistent with data presented by the ASMFC regarding red knot and horseshoe crab populations. Egg density and achieving the thresholds set in Addendum VII were also mentioned in more than one letter. Though one could argue the accuracy of the statements and data in the letters, the spirit of the letters was clear, reflecting a desire to protect female horseshoe crabs for the benefit of the crabs, the ecosystem and the red knot.

The attending members of the AP pointed out that this goal is consistent with that of the original ARM and that of the revised ARM. Reverting back to Addendum VI would not prohibit female harvest, in fact it would allow it in Maryland. Additionally, the original harvest packages were based on data that is over 10 years old and does not represent a science based, structured decision-making process that is utilized for species under management of the ASMFC. AP members expressed that the ARM was useful since inception, has provided protection of female crabs, and should continue to evolve as new technology, data and science presents itself.

Therefore, there was unanimous support among the advisors on the call for Option B to implement the 2021 ARM Revision for setting harvest specifications for Delaware Bay-origin crabs. Each of the bullets below summarizes the input of individual advisors.

M22-107

- The Board should adopt the revised ARM because it is science-based management and the best we have, and the science should not be ignored. Reverting back to Addendum VI would be going backward because we have so much more information now. Both options give the states similar amounts of harvest, just spread out a little differently. Sub-option B1 seems more reasonable and there is no need to round the optimal harvest output down by 50,000 crabs. It should be noted that reverting back to Addendum VI would also allow female harvest in Maryland.
- As someone who fishes for horseshoe crabs for biomedical and some for bait, it would be fine to open up a small amount female harvest for bait, but that it does not need to increase by a lot. 10,000-12,000 females for Maryland would not be a problem and would not harm the progress we have made. There have been large increases in the population in recent years; it is not in danger or being overfished but management should be cautious with it. Harvesting fewer females is working for the population and will keep it sustainable.
- Based on the data, supports Option B. Option A for no action would reduce bait harvest unnecessarily from current levels.
- Support for Option B, with no strong preference for either of the sub-options.
- Supports Option B to use the revised ARM to maintain sustainable harvest by using the best science. As a bait dealer in the northeast, this advisor sees demand for bait in the south. If the horseshoe crab harvest in the Delaware Bay region is cut back it will increase demand in the northeast, and he does not want to see that additional pressure on those populations.
- Although Addendum VIII is overwhelmingly unpopular with the public comments, this advisor thinks the ARM model has to be updated and the method for calculating the harvest specifications needs to evolve, therefore Option B is the most sensible. It could be helpful to limit the amount of female crabs harvested for bait because males are more abundant, but ultimately management should follow the science.
- The Board should not throw away the ARM Framework. Acknowledging the overwhelming opposition to the upgrade to the ARM from the public comments, this advisor has faith in the ARM and the science behind it and supports Option B. He is also concerned about the balloon effect on bait demand that the dealer mentioned if Delaware Bay bait harvest is reduced further. He was not opposed to the Board limiting females a bit more to be conservative, but at some point modest harvest is allowable based on the science. He also noted that reverting to Addendum VI would take quota off the table compared to current harvest, especially for Delaware and Maryland.

General Comments

Several advisors raised concerns about the weight carried by the form letters submitted as part of the public comments. They were concerned that the signatories did not actually have to understand what they were advocating for, they just had to sign and send the pre-written message. The process is much more complex than it is often described, and this oversimplification is not an accurate description of the model.

It was noted that states still have the ability to limit harvest in their respective waters, and can be more conservative than the Commission's management plan.



Atlantic States Marine Fisheries Commission

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MEMORANDUM

TO: Horseshoe Crab Management Board
FROM: Horseshoe Crab Adaptive Resource Management (ARM) Subcommittee and Delaware Bay Ecosystem Technical Committee
DATE: October 21, 2022
SUBJECT: Horseshoe Crab Harvest Recommendations Based on the ARM Framework

Background

Addendum VII (2012) established the Adaptive Resource Management (ARM) Framework, which incorporates both red knot and horseshoe crab abundance levels to set harvest levels for horseshoe crabs of Delaware Bay-origin. As part of the routine stock assessment schedule and because the original software used for the Framework is now obsolete and no longer supported, the ARM Framework was revised in 2021. The purpose of revising the ARM Framework was to address previous peer review critiques, include newly available data, and adopt advances in modeling software and optimization approaches. The ARM Revision (2021) was peer reviewed and accepted for management use by the Horseshoe Crab Management Board (Board). The Board initiated Draft Addendum VIII to consider formalizing the use of the ARM Revision for setting harvest specifications for horseshoe crabs of Delaware Bay-origin, and a public comment period occurred in August and September 2022. The Board will consider final action on Draft Addendum VIII at the November 2022 Board meeting.

Under the annual process of the ARM Framework, the ARM Subcommittee recommends harvest specifications for the upcoming year based on the ARM Framework results. The Delaware Bay Ecosystem Technical Committee (DBETC) then reviews the ARM results and recent horseshoe crab and red knot monitoring data to provide a recommendation for harvest specifications to the Board. This year, because the Draft Addendum VIII has not been finalized, the ARM considered harvest specifications generated using the original ARM Framework as well as the 2021 ARM Framework Revision. Two enclosed documents provide the details of the ARM Results and the discussions and recommendations of the ARM Subcommittee and DBETC:

- 1) 2023 Horseshoe Crab Harvest Recommendations Based on Adaptive Resource Management (ARM) Framework and Recent Monitoring Data: Report to the Delaware Bay Ecosystem Technical Committee by the ARM Subcommittee, October 2022
- 2) ARM Subcommittee and DBETC Meeting Summary from October 12, 2022

The key recommendations from the committees are highlighted below.

Committee Recommendations

The consensus recommendation from the DBETC and ARM Subcommittee members is to use the harvest recommendation from the 2021 ARM Revision. Because Draft Addendum VIII contains two options for rounding the harvest output from the ARM to protect confidential data, two possible harvest limits were generated using the revised ARM:

- 1) 475,000 male and 125,000 female horseshoe crabs; or
- 2) 450,000 male and 100,000 female horseshoe crabs

Consistent with the proposed allocation methodology in Draft Addendum VIII, the resulting state allocations of the Delaware Bay origin quota and total state quotas would be one of the two options presented in the table below, depending on the rounding option selected by the Board when final action is taken on Draft Addendum VIII. One committee member felt the quota caps for MD and VA that were established in Addendum VII should be removed.

Additionally, both committees recommend that the Board consider implementing the provision from Addendum VI that was omitted from Addendum VII that prohibits harvest and landings of all horseshoe crabs in New Jersey, Delaware, and Maryland from January 1 through June 7, and also prohibits the landing of horseshoe crabs in Virginia from federal waters from January 1 through June 7. This requirement would offer protection to spawning horseshoe crabs and reduce disturbance to migrating shorebirds foraging on the beaches.

Table 1. Delaware Bay-origin and total horseshoe crab quota for 2023 by state and rounding convention options included in Draft Addendum VIII. Virginia total quota only refers to the amount that can be harvested east of the COLREGS line.

Using sub-option B1 to round down to the nearest 25,000				
State	Delaware Bay Origin Quota		Total Quota	
	Male	Female	Male	Female
Delaware	164,364	43,254	164,364	43,254
New Jersey	164,364	43,254	164,364	43,254
Maryland	126,220	33,215	135,100	35,553
Virginia	20,052	5,277	40,667	20,331
TOTAL	475,000	125,000	504,495	142,390

Using sub-option B2 to round down to the nearest 50,000				
State	Delaware Bay Origin Quota		Total Quota	
	Male	Female	Male	Female
Delaware	155,713	34,603	155,713	34,603
New Jersey	155,713	34,603	155,713	34,603
Maryland	119,578	26,573	139,625	31,028
Virginia	18,996	4,221	40,667	20,331
TOTAL	450,000	100,000	491,718	120,564

2023 Horseshoe Crab Harvest Recommendations Based on Adaptive Resource Management (ARM) Framework and Recent Monitoring Data

Report to the Delaware Bay Ecosystem Technical Committee
(DBETC) by the ARM Subcommittee

October 2022

This report describes the 2023 harvest recommendation for Delaware Bay horseshoe crabs using two methods: the Adaptive Resource Management (ARM) Framework adopted in 2013 (Section 1) and the Revised ARM Framework from 2021 (Section 2). The DBETC and ARM subcommittee met via conference call on October 12th to review the results and make recommendations to the Board (Section 3).

Established through Addendum VII (2012), the ARM Framework incorporates both shorebird and horseshoe crab abundance levels to set optimized harvest levels for horseshoe crabs of Delaware Bay-origin. The ARM Framework used a program called Adaptive Stochastic Dynamic Programming (ASDP) which produces a large look-up table that included the recommended harvest for all possible states of the horseshoe crabs and red knots populations and the recommended, or optimal, harvest for each combination of population estimates. The look-up table was created in 2012 and refreshed in 2016. In the interim years, the table provided the annual harvest recommendations.

As part of the routine stock assessment schedule and because the ASDP program is now obsolete and unmaintained, the ARM Framework was revised in 2021. The purpose of revising the ARM Framework was to address previous peer review critiques, include newly available data, and adopt advances in modeling software and optimization approaches. The ARM Revision (2021) was peer reviewed and accepted for management use by the Horseshoe Crab Management Board (Board), but Draft Addendum VIII, the management document that formalizes its implementation, has not been approved by the Board. The Board will consider final action on Draft Addendum VIII at the November 2022 Board meeting.

1. Harvest Recommendation Based on 2013 ARM Framework

This section summarizes the 2023 harvest recommendations using the ARM Framework adopted in 2013. Detailed background on the ARM Framework and data sources can be found in previous technical reports (ASMFC 2009; McGowan et al. 2009; ASMFC 2012).

1.1. Objective statement

Manage harvest of horseshoe crabs in the Delaware Bay to maximize harvest but also to maintain ecosystem integrity and provide adequate stopover habitat for migrating shorebirds.

1.2. Population Models

Underlying the original ARM model are population models for both red knots and horseshoe crabs. The ARM model uses an optimization routine which is a procedure for finding the best solution given the current state of the Delaware Bay system.

Population dynamics models that link horseshoe crabs and red knots were used to predict the effect of harvest packages. In the ARM Framework, the model determines the best choice among five potential harvest packages (numbers of male and females that can be harvested) given the current abundance of red knots and horseshoe crabs. ASDP was used to create a decision matrix to identify the optimal harvest package given the most recent monitoring data.

1.3. Monitoring data

Red knot abundance estimates are taken from a mark-resight estimate (Figure 1). The spring estimate from 2022 was 39,800 red knots. These data and methods can be evaluated in Lyons 2022.

Sources of data for horseshoe crab abundance were a set of trawl surveys conducted by Virginia Tech university (Wong et al. 2022). For the ARM Framework, newly mature and mature horseshoe crabs from the Delaware Bay swept area population estimates calculated using the delta distribution model are added together (Table 1). Next, the total mature population estimates (newly mature plus mature) are decremented by half a year of natural mortality ($M=0.274$) to account for time between when the survey operates in the fall and the population lays eggs on the beach in the following spring. Therefore, 13.5 million females and 39.1 million males were used as an input to the Framework.

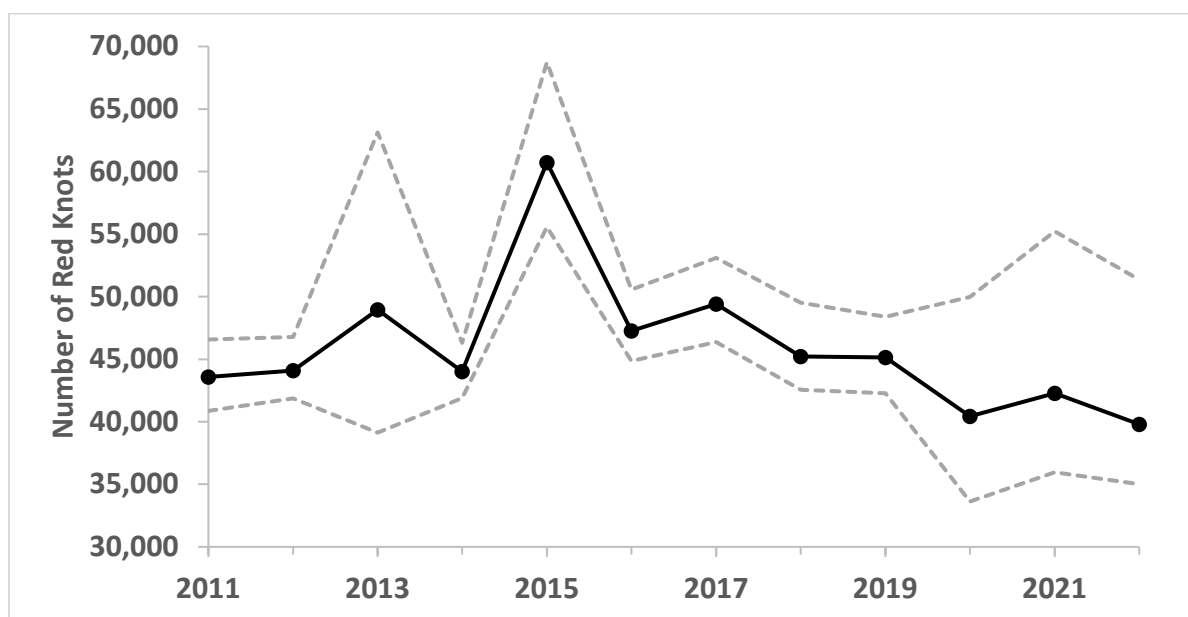


Figure 1. Mark-resight abundance estimates for the red knot stopover population with 95% confidence intervals, 2011-2022.

Table 1. Horseshoe crab population estimates by sex and stage from the Virginia Tech Trawl Survey used in the ARM Framework.

Year	Females (in millions)			Males (in millions)		
	Newly Mature	Mature	Total	Newly Mature	Mature	Total
2002	1.5	5.0	6.5	0.5	11.6	12.1
2003	0.8	3.4	4.2	0.1	8.1	8.1
2004	0.4	2.7	3.1	0.8	5.2	5.9
2005	0.5	3.1	3.6	0.6	5.8	6.4
2006	2.1	6.6	8.7	3.1	15.8	18.9
2007	2.4	7.7	10.1	3.1	15.8	18.9
2008	2.6	6.3	8.9	0.8	14.6	15.4
2009	0.9	3.0	3.9	0.7	6.2	7.0
2010	1.3	5.2	6.5	1.4	14.0	15.4
2011	0.8	5.3	6.1	0.7	15.1	15.8
2012 ¹	-	-	-	-	-	-
2013	-	-	-	-	-	-
2014	-	-	-	-	-	-
2015	-	-	-	-	-	-
2016	1.6	6.0	7.6	2.6	21.9	24.5
2017	1.5	7.2	8.7	1.5	20.7	22.2
2018	1.8	7.3	9.1	3.3	15.7	19.1
2019	0.2	5.1	5.4	1.3	8.9	10.2
2020	0.1	10.8	10.9	2.5	31.5	34.0
2021	0.0	15.5	15.5	6.3	38.5	44.9

¹ The Virginia Tech Trawl Survey was not conducted in 2012-2015.

1.4. Harvest packages

The five harvest packages were compared to determine which will best meet the objective statement given the most recent monitoring data (Table 2). Harvest is of adult horseshoe crabs of Delaware Bay-origin.

Table 2. The five possible harvest packages in the ARM Framework (2012).

Harvest package	Male harvest	Female harvest
1	0	0
2	250,000	0
3	500,000	0
4	280,000	140,000
5	420,000	210,000

1.5. Harvest recommendation

The decision matrix was optimized incorporating recommendations on red knot stopover population estimates and associated calibration of a red knot utility threshold (81,900 red knots) as well as the horseshoe crab population estimates and a female horseshoe crab population utility threshold (11.2 million). The accepted procedure used in all past years was followed.

The recommended harvest package for the 2023 fishing year is package 5, or 420,000 male and 210,000 female horseshoe crabs. This is the first time since the ARM Framework was implemented that female horseshoe crab population estimates have exceeded their 11.2 million threshold and that a harvest package other than 3 has been recommended.

1.6. Quota Allocation

Allocation of allowable harvest under ARM package 5 (420,000 males, 210,000 females) was conducted in accordance with management board approved methodology in Addendum VII (Table 3).

Table 3. Delaware Bay-origin and total horseshoe crab quota for 2023 by state. Virginia total quota in the table only refers to the amount that can be harvested east of the COLREGS line. Virginia’s overall state quota is 152,495 crabs, but only 40% of that may be harvested east of the COLREGS line.

State	Delaware Bay Origin Quota		Total Quota		
	Male	Female	Male	Female	Sexes Combined
Delaware	136,195	68,097	136,195	68,097	204,292
New Jersey	136,195	68,097	136,195	68,097	204,292
Maryland	118,533	59,268	113,769	56,884	170,654
Virginia	29,077	14,538	40,665	20,333	60,998
Total	420,000	210,000	398,382	241,854	640,236

2. Harvest Recommendation Based on 2021 ARM Revision

This section summarizes annual harvest recommendations using the ARM Framework Revision developed in 2021. Detailed background on the ARM Framework and data sources can be found in the ARM Revision report (ASMFC 2022).

2.1. Objective Statement

Manage harvest of horseshoe crabs in the Delaware Bay to maximize harvest but also to maintain ecosystem integrity, provide adequate stopover habitat for migrating shorebirds, and ensure that the abundance of horseshoe crabs is not limiting the red knot stopover population or slowing recovery.

2.2. Population estimates

In the ARM Revision, all quantifiable sources of mortality (i.e., bait harvest, coastwide biomedical mortality, and commercial dead discards; Figure 2 - Figure 3) were used in the catch multiple survey analysis (CMSA) to estimate male and female horseshoe crab population estimates for 2003-2021 (Figure 4). Population estimates for horseshoe crabs were made using the coastwide biomedical data or no biomedical data which provide upper and lower bounds for the public. The harvest recommendation will be based on the results using confidential biomedical data from the region. The Virginia Tech Trawl Survey estimates are used in the CMSA along with the New Jersey Ocean Trawl and the Delaware Fish and Wildlife Adult Trawl Surveys (ASMFC 2022; Wong et al. 2022).

The 2021 CMSA population estimates for mature females is lower than those from the Virginia Tech Trawl Survey due to a few reasons. For one, the two estimates use different methods. Total abundance is estimated by extrapolating the mean catch-per-tow to the Delaware Bay sampling area for the Virginia Tech trawl versus a population model with the CMSA. Because the VA Tech Trawl Survey is conducted in the fall, the CMSA lags the Virginia Tech Trawl Survey forward to match the timing of the other two trawl surveys and most recent harvest data (i.e., the 2020 Virginia Tech trawl values are used in the model to estimate abundance in 2021; Figure 5). Thirdly, the CMSA population estimates are influenced by the staged abundance data from the Virginia Tech Trawl Survey, and the abundance of newly mature females was very low in 2019-2021 (Table 1). The CMSA is a simple, stage-based model that essentially sums the newly mature and mature crabs, subtracts harvest and accounts for natural mortality, and predicts the next year's population. Since the newly mature female estimates have been low, the model estimated lower population estimates than those of the Virginia Tech Trawl Survey in 2021.

Red knot abundance estimates used to make harvest recommendations under the ARM Revision are the same as those used in the original ARM Framework and based on mark-resight total stopover population estimates (Figure 1; Lyons 2022).

In summary, in the Delaware Bay region in 2021, there were approximately 15.9-16.0 million mature male and 6.0-6.1 million mature female horseshoe crabs (the range represents the difference between using coastwide and no biomedical data). The 2021 red knot population estimate was 42,271.

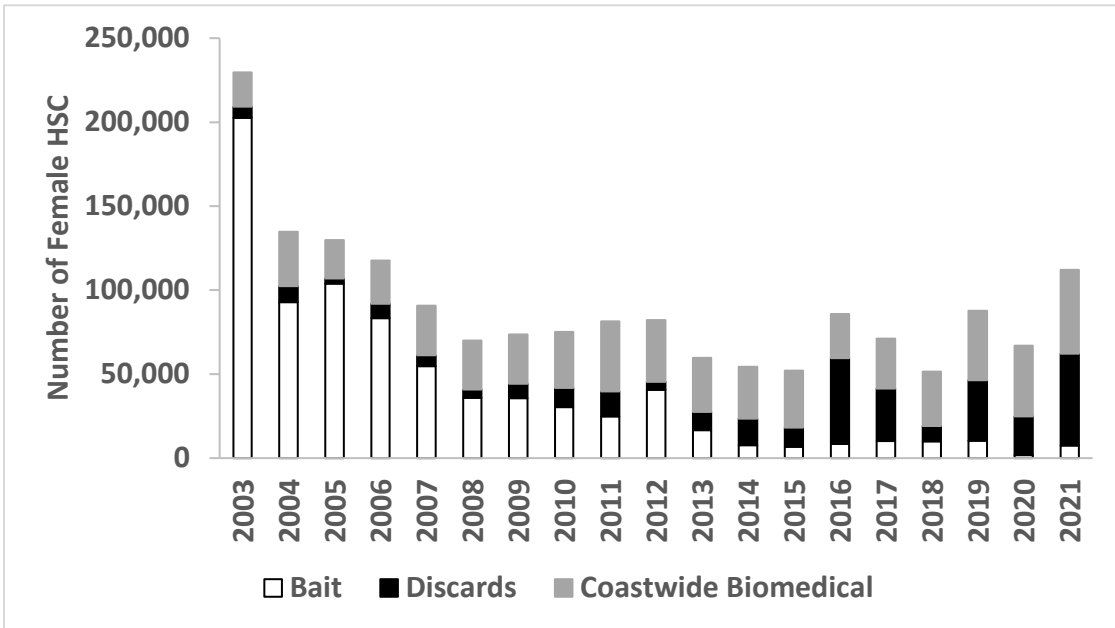


Figure 2. Total female horseshoe crab harvest by source in the Delaware Bay, 2003-2021.

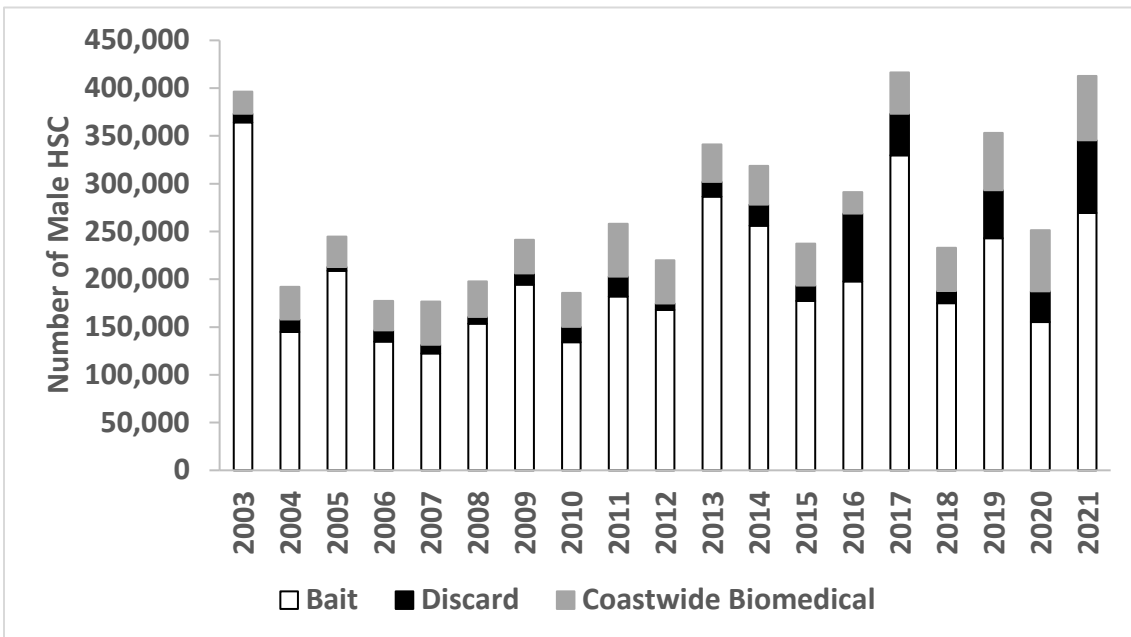


Figure 3. Total male horseshoe crab harvest by source in the Delaware Bay, 2003-2021.

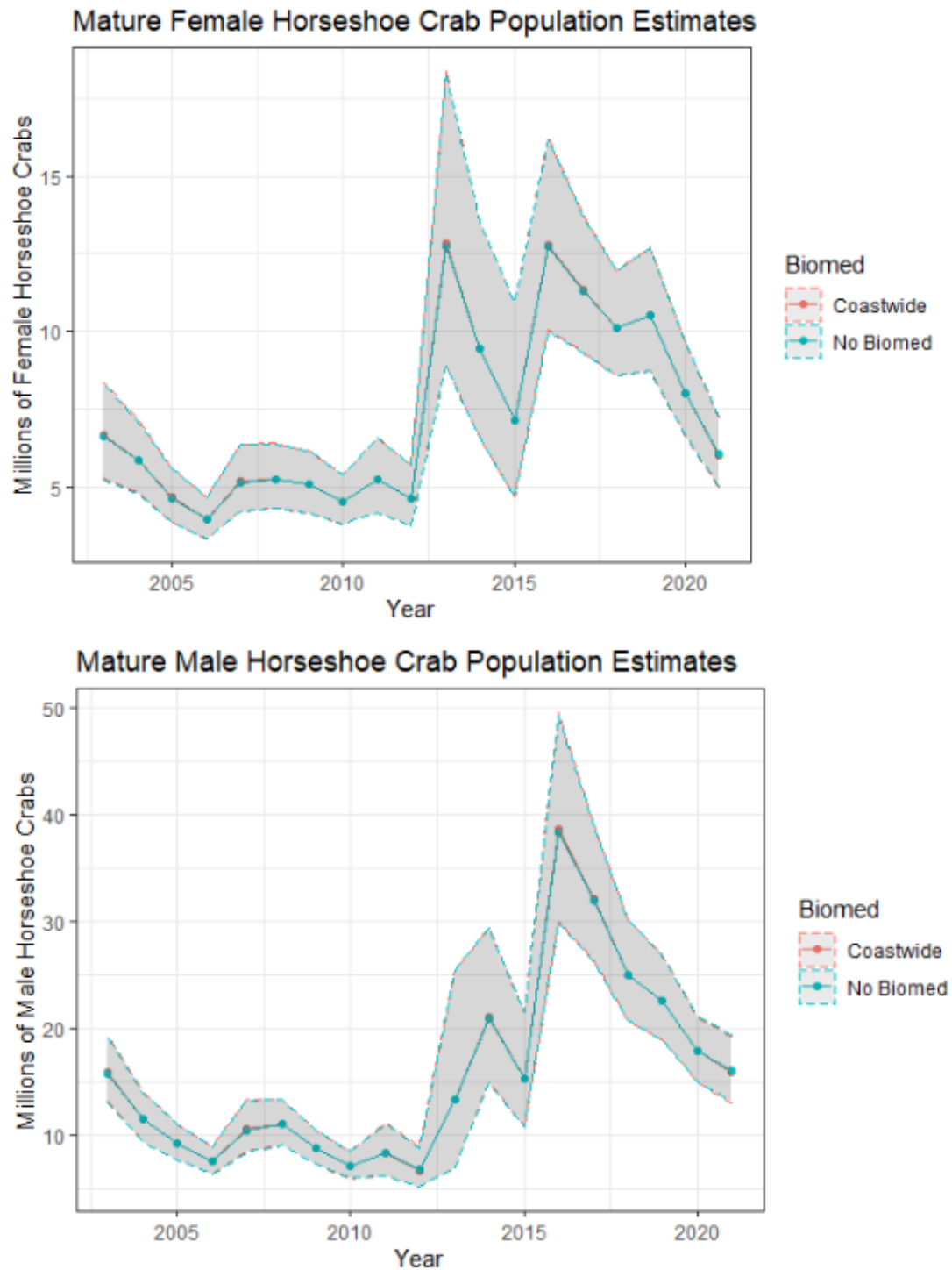


Figure 4. Population estimates from the CMSA for mature female (top) and male (bottom) horseshoe crabs with 95% confidence intervals. Delaware Bay biomedical data is confidential so population estimates using coastwide and zero biomedical data provide upper and lower bounds, although there is very little difference between the two and the time series overlap on the figures.

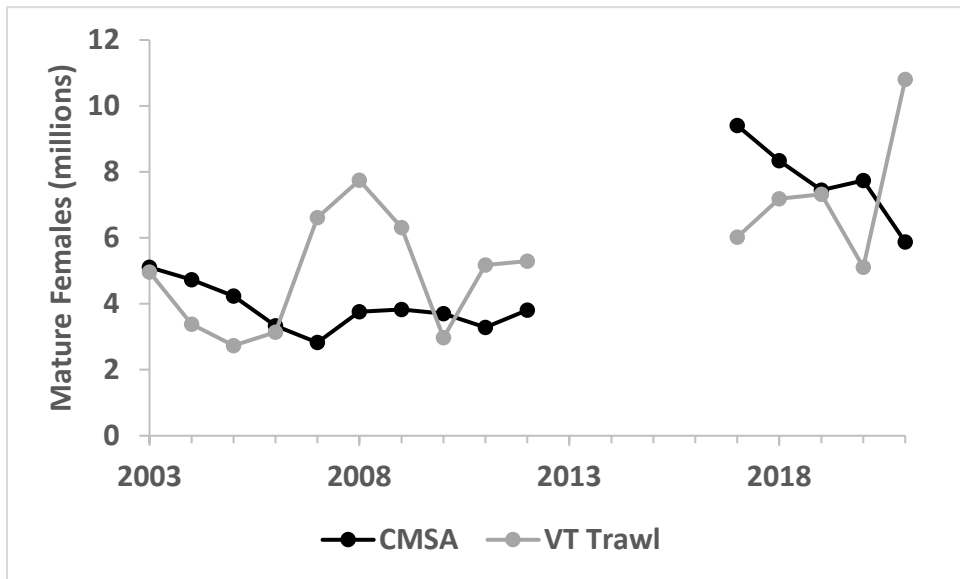
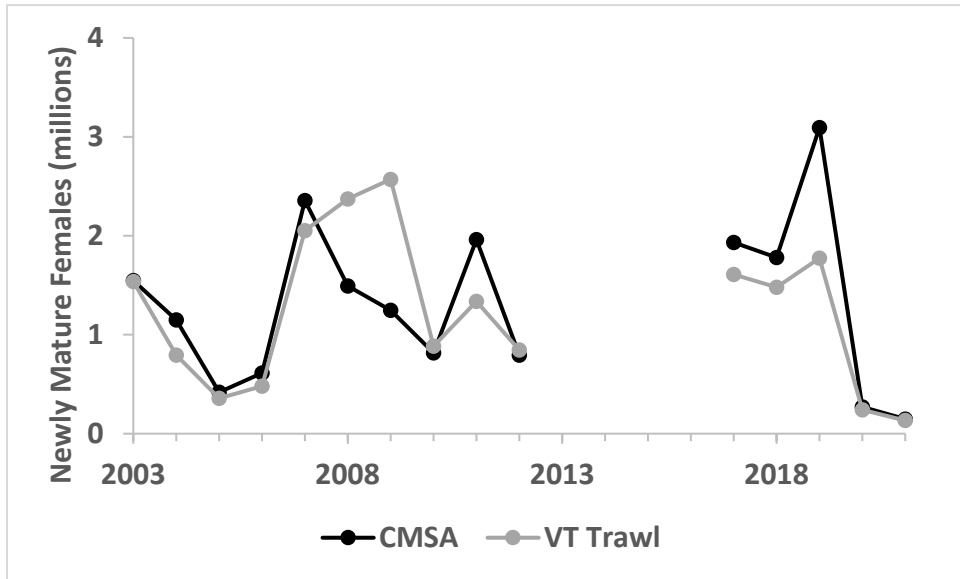


Figure 5. Comparison of newly mature and mature female horseshoe crab estimates between the catch multiple survey analysis (CMSA) using coastwide biomedical data and Virginia Tech Trawl Survey (VT Trawl) 2003-2021. VT Trawl data is lagged forward one year from the values reported in Table 1.

2.3. Harvest Recommendation

Harvest recommendations for the 2023 fishing year made using the ARM Revision are based on CMSA estimates of horseshoe crab abundance and the red knot mark-resight abundance estimate in 2021. This is because the complete data series needed to run the CMSA in 2022 is not yet available since bait and biomedical removals are not finalized for 2022 when the model is run in the fall. The time lag between when CMSA estimates of crab abundance are available (e.g., a terminal year of 2021), the annual harvest decision is made (e.g., at the Board meeting in November 2022), and when harvest recommendations are actually implemented (e.g., the 2023 fishing year) was incorporated into the ARM Revision optimization.

ARM Revision harvest recommendations are based on a continuous scale rather than the discrete harvest packages in the previous Framework. Therefore, a harvest number up to the maximum allowable harvest could be recommended, not just the fixed harvest packages (Table 2). Harvest of females is decoupled from the harvest of males so that each are determined separately. The maximum possible harvest for both females and males are maintained from the previous ARM Framework at 210,000 and 500,000, respectively.

The annual decision of allowable Delaware Bay horseshoe crab harvest is based on current state of the system (abundances of both species in the previous calendar year) and the optimal harvest policy functions from the ARM Revision. Annual estimates of horseshoe crab and red knot abundances are used as input to the harvest policy functions, which then output the optimal horseshoe crab harvest to be implemented.

Two options were given in draft Addendum VIII which were to round down the optimal harvest to the nearest 25,000 or 50,000 crabs to uphold data confidentiality. Two harvest recommendations, one using each rounding option, have been provided here based on an optimal harvest level given horseshoe crab abundance and red knot abundance in 2021 (Table 4). The horseshoe crab abundance in 2021 was determined by using the confidential Delaware Bay biomedical data in the CMSA. If the Board chooses to use the 2021 ARM Revision to set Delaware Bay bait harvest specifications as proposed in Draft Addendum VIII, it may select one of the options provided below.

Table 4. Harvest recommendations from the 2021 ARM Revision depending on the rounding convention options given in Draft Addendum VIII.

Using sub-option B1 to round down to the nearest 25,000	
Male harvest	Female harvest
475,000	125,000

Using sub-option B2 to round down to the nearest 50,000	
Male harvest	Female harvest
450,000	100,000

2.4. Quota Allocation

Quota of horseshoe crab harvest for Delaware Bay region states. Allocation of allowable harvest was conducted in accordance with the methodology proposed in Draft Addendum VIII (Table 5).

Table 5. Delaware Bay-origin and total horseshoe crab quota for 2023 by state and rounding convention options included in Draft Addendum VIII. Virginia total quota only refers to the amount that can be harvested east of the COLREGS line.

Using sub-option B1 to round down to the nearest 25,000				
State	Delaware Bay Origin Quota		Total Quota	
	Male	Female	Male	Female
Delaware	164,364	43,254	164,364	43,254
New Jersey	164,364	43,254	164,364	43,254
Maryland	126,220	33,215	135,100	35,553
Virginia	20,052	5,277	40,667	20,331
TOTAL	475,000	125,000	504,495	142,390

Using sub-option B2 to round down to the nearest 50,000				
State	Delaware Bay Origin Quota		Total Quota	
	Male	Female	Male	Female
Delaware	155,713	34,603	155,713	34,603
New Jersey	155,713	34,603	155,713	34,603
Maryland	119,578	26,573	139,625	31,028
Virginia	18,996	4,221	40,667	20,331
TOTAL	450,000	100,000	491,718	120,564

3. Committee Recommendation

There was consensus among the DBETC and ARM Subcommittee members that the harvest recommendation produced by application of the ARM Revision (Section 2) was preferred over that from the previous ARM Framework (Section 1). One committee member felt the quota caps for MD and VA that were established in Addendum VII should be removed. Additionally, both committees recommend the Board consider implementing the provision from Addendum VI that was omitted from Addendum VII that prohibits directed harvest and landings of all horseshoe crabs in New Jersey and Delaware from January 1 through June 7. The committees were in agreement that this

provision would provide additional protection for horseshoe crabs during beach spawning and red knot stopover.

4. References

ASMFC. 2009. A Framework for Adaptive Management of Horseshoe Crab Harvest in the Delaware Bay Constrained by Red Knot Conservation, Stock Assessment Report No. 09- 02 (Supplement B) of the Atlantic States Marine Fisheries Commission. Washington D.C. 51pp.

ASMFC. 2012. Addendum VII to the Fishery Management Plan for Horseshoe Crab. Washington D.C. 10pp.

ASMFC. 2022. Revision to the Framework for Adaptive Management of Horseshoe Crab Harvest in the Delaware Bay Inclusive of Red Knot Conservation and Peer Review Report. Arlington, VA. 302 pp.

Lyons, J.E. 2022. Red Knot Stopover Population Estimate for 2021. Memorandum to the Delaware Bay ARM Working Group. U.S. Geological Survey Patuxent Wildlife Research Center, Laurel, Maryland. 13 pp.

McGowan, C. P., D. R. Smith, J. D. Nichols, J. Martin, J. A. Sweka, J. E. Lyons, L. J. Niles, K. Kalasz, R. Wong, J. Brust, M. Davis. 2009. A framework for the adaptive management of horseshoe crab harvests in the Delaware Bay constrained by Red Knot conservation. Report to the Atlantic States Marine Fisheries Commission Horseshoe Crab Technical Committee.

Wong, C. Y. Jiao, and E. Hallerman. 2022. Results of the 2021 Horseshoe Crab Trawl Survey: Report to the Atlantic States Marine Fisheries Commission Horseshoe Crab and Delaware Bay Ecology Technical Committees. 27 pp.

Several advisors agreed that population trends for horseshoe crabs appear to be favorable since the original ARM was implemented.

One advisor said they would like to see the Virginia Tech trawl survey run nighttime tows earlier in the year (late May – July) because they are seeing large numbers of juveniles at those times. They are everywhere, not just off Maryland, and that should be recorded by the survey.

This advisor also noted that more and more human development is being built on the beaches, and that means less access for birds and crabs on the beaches for foraging and spawning. Red knots do not like people around. The whole east coast is being developed on waterfronts, and that is taking up habitat. For this reason, we cannot only blame the horseshoe crab numbers for the red knots declines in these areas.

Two other advisors agreed with this comment, and added that when the red knot was listed as threatened, horseshoe crab egg availability was only one contributing factor, not the only contributing factor for the red knot status. Other threats, like disturbances to the birds while feeding, were also included.

One advisor who could not attend the meeting provided the following input by email:

The comments provided are interesting and highlight the potential nuances that could be considered for recommending Option B (e.g., what might be a scientifically reasonable number for settling on the amount of the female harvest; how best to manage regional shifts in demand for bait, etc). It is clear the ARM model has to be updated and the method for calculating the harvest specifications needs to evolve, and therefore unanimous AP support for Option B is not surprising and seems most sensible. But it is not clear how best to achieve that goal.

It is true there are multiple stressors on red knot populations, and the AP comments are spot on about this. There are additional key aspects of red knot decline such as the disturbance to birds and habitat from relentless coastal development. That must be kept in mind when discussing horseshoe crab harvest impacts and supporting management recommendations.

This advisor also strongly recommended there be a discussion about how to communicate and explain the gap between public opinion and that of the AP on Draft Addendum VIII, stating that it seems the biggest problem here is communication.

Atlantic States Marine Fisheries Commission

Horseshoe Crab Adaptive Resource Management Subcommittee & Delaware Bay Ecosystem Technical Committee Conference Call

Call Summary

Wednesday, October 11, 2022

9:00 AM - 11:00 AM

Attendance:

Horseshoe Crab Adaptive Resource Management Subcommittee: John Sweka (Chair), Jim Lyons (Vice Chair), Henrietta Bellman, Linda Barry, Steve Doctor, Wendy Walsh, Margaret Conroy, Bryan Nuse

Delaware Bay Ecosystem Technical Committee: Wendy Walsh (Chair), Henrietta Bellman (Vice Chair), Adam Kenyon, Eric Hallerman, Yan Jiao, Jordy Zimmerman, Steve Doctor, Samantha MacQuesten

Horseshoe Crab Technical Committee Members*: Adam Kenyon, Catherine Fede, Claire Crowley, Jeffrey Dobbs, Jordy Zimmerman, Samantha MacQuesten, Steve Doctor, Chris Wright

ASMFC Staff: Caitlin Starks, Kristen Anstead, Toni Kerns

Additional Attendees: John Clark, Brett Hoffmeister, Bill Hyatt, Shanna Madsen, Jesse Hornstein, Clint Moore, Daniel Sasson, Kristoffer Whitney, Chad Wong, Sheila Eyler, Robert LaFrance

The Adaptive Resource Management (ARM) Subcommittee and the Delaware Bay Ecosystem Technical Committee (DBETC) met via webinar to review the most recent population estimates for horseshoe crabs and red knots, the harvest recommendations from the ARM for the 2023 fishing year, and supporting horseshoe crab and red knot data sets. Below are the agenda items and summary of the committee's discussion and decisions.

1. Survey Results for 2021 Horseshoe Crab (Eric Hallerman)

Eric Hallerman presented the Virginia Tech (VT) Trawl Survey results for 2021. Yan Jiao and Chad Wong provided analytical support for the report given to the ARM and DBETC. The lower Delaware Bay survey ended earlier than in most years due to a net being obstructed and destroyed. The average bottom temperature was the highest seen in the time series. Mean stratified catches-per-tow were at their highest point in the time-series for mature males, mature females, and newly mature males. Mean catch-per-tow of immature male and female horseshoe crabs in the coastal Delaware Bay area have remained variable since 2002 and have no apparent trend. Mean catch-per-tow of newly mature male horseshoe crabs in the coastal Delaware Bay area remained highly variable, with newly mature males showing a minor positive trend over the study period. Newly mature females have remained relatively low since 2019 and no newly mature females were observed in 2021. Mean catch-per-tow of mature male and

female horseshoe crabs in the coastal Delaware Bay area continue to be highly variable, with their highest points in 2021, showing a positive trend over the time-series. Correlation analyses showed that mean catch-per-tow of all demographic groups may be correlated with ordinal date, and mean catch-per-tow of immature and mature individuals may be correlated with temperature.

The committees discussed the finding of zero newly females being caught in the study areas. Hypotheses posed for the low numbers of newly mature crabs include a spatial distribution difference in recent years that has affected the trawl survey's ability to capture crabs at this state, a recruitment failure a decade ago, or misclassification of stage by the survey crew, which has changed in recent years. The ARM Subcommittee will need to discuss how this estimate will impact the ARM model when the VT Tech trawl data are used next year since the catch survey model relies on estimates of newly mature crabs to predict abundance in the following year.

The 2022 sampling season is currently underway, but has been slowed down due to hurricane activity. Eric noted that, anecdotally, numbers of crabs appear to be down, but they are seeing crabs in places where they are not usually seen. They are also seeing immature crabs getting soft and ready to molt although temperatures have not declined much.

2. Survey Results for 2022 Red Knots (Jim Lyons)

Jim Lyons presented the red knot stopover population estimate. The population estimate for red knots is 39,800 birds for 2022 (95% credible interval: 35,013 – 55,355). This estimation is a decrease from 2021, and was below 40,000 birds for the first time since 2011. The confidence intervals around the population estimates for 2020-2022 are wider than in previous years, which can be attributed to decreased survey effort due to COVID-19 restrictions. The 2022 red knot mark-resight data set included a total of 1,546 individual birds that were recorded at least once during mark-resight surveys at Delaware Bay in 2022, a similar number to the previous two years. This year few birds arrived before May 13th; about 20% arrived near May 15th and the proportion arriving peaked at 25% around May 27th. The stopover population increased steadily from the beginning of the season and peaked around May 18–21. The persistence pattern was fairly typical, with a peak early in the sampling season, and then declining toward the end of the season. The resight probability was low at the beginning of sampling but increased to around 50% at the end of the season.

It was noted by the ARM subcommittee that a decline in the accompanying aerial counts for 2022 may have been affected by an air show at the Air Force Base in Delaware on May 24th. Henrietta Bellman reported that Delaware resighting survey effort was comparable to pre-COVID levels.

3. Review of Supplementary Surveys for Horseshoe Crabs and Red Knots

a. NJ Ocean Trawl Survey (Lindy Barry)

Lindy Barry reminded the groups that the NJ Ocean Trawl did not run in 2020 or 2021 due to COVID restrictions. Since 2010, there has been an increasing trend through the terminal year of 2019.

In 2022, the survey was reinitiated starting in April. For the months used in the ARM model, preliminary numbers from the April are the highest in time series and the August numbers also seem relatively high. Lindy noted that due to budget issues fewer samples will be taken in the survey. For the 60ft and 90ft depth strata, there will be one less tow per cruise, resulting in a total of 60 instead of 78 samples. There is not a concern that this will significantly impact the quality of the data.

Wendy Walsh asked how the missing years of data from the NJ Ocean Trawl affect the results of the catch multiple survey analysis (CMSA). Kristen said that the CMSA can handle missing years of data because there are three surveys of relative abundance included in the model now.

b. DE Bay 30 ft. Trawl Survey and Spawning Survey (Jordy Zimmerman)

Jordy Zimmerman reviewed the DE Bay 30ft and 16ft Trawl Survey methods and sampling routine for horseshoe crabs. For the 30ft trawl, the 2021 catch per unit effort is above time series mean for April-July and all months. In the 16ft trawl the adult catch in 2021 is below the time series mean. Juvenile and young-of-year crab catch is also decreased in 2021, and have been below the time series mean since 2017. Staging of crabs caught in the surveys has occurred since 2017. The survey routinely catches more multiparous crabs than primiparous crabs, as expected, although most primiparous crabs caught were female and most multiparous crabs were male.

The spawning survey is used by the ARM for providing a sex ratio of males to females on the spawning beaches. Jordy noted that 36 sampling occasions (14%) were missed for 2021, which is a relatively low proportion for the time series. However, of the 36 samples missed, 22 occurred in the second lunar period in May, which is usually a time of high horseshoe crab abundance.

The index of female spawning availability for DE and NJ shows a slight but insignificant positive slope, with the 2021 values near the time series means. The 2021 index of male spawning availability for DE and NJ are above the time series mean, and show a significant increasing trend for both states. The Baywide female index shows no trend, while the Baywide male index shows an increasing trend. Peak spawning in 2021 occurred May 9 – 13 for DE (the first time the peak occurred in the 1st lunar period), and May 24 – 28 (2nd lunar period) for NJ.

c. Shorebird survey

Henrietta Bellman gave a summary of red knot sampling in Delaware. Henrietta said in Delaware it was a more typical year in terms of effort than the previous years which were impacted by COVID-19 restrictions. Team size and catch effort were similar to before COVID impacts. However, she noted that the capture success rate was low, amounting to about half of

the 2019 numbers of captures. The number of ratio scans were comparable to 2019, but the number of resights and unique flags were about half of the 2019 values. She also noted that this year they had a difficult time finding red knots outside the Mispillion site.

The committees discussed that ASMFC staff and committee chairs should work with Henrietta and Wendy to strategize on what red knot survey information should be presented to the ARM Subcommittee and DBETC on an annual basis. Staff will follow up to determine what summary information from the shorebird surveys would be most beneficial for the committees to consider when discussing ARM harvest recommendations.

4. Review Results of ARM Model

The sections below summarize the committees' discussion on the ARM results. Details on the methods applied and the results themselves are provided in the memo to the Board from the ARM Subcommittee and DBETC dated October 20, 2022.

a. Results from original ARM Framework

John Sweka reviewed the ARM model structure and annual process for the committees. Conor McGowan used the horseshoe crab population estimates from the Virginia Tech Trawl report and red knot population estimates in the optimization matrix of the original ARM model and determined the resulting harvest recommendation. Using the old ARM Framework, the recommended harvest package for the 2023 fishing year is package 5, or 420,000 male and 210,000 female horseshoe crabs. John noted that this is the first time since the ARM Framework was implemented that female horseshoe crab population estimates have exceeded their 11.2 million population utility threshold and that a harvest package other than package 3 has been recommended. Red knots remain below the population utility threshold established in the original ARM (81,900 birds).

b. Results from 2021 ARM Framework Revision

Kristen Anstead reviewed the annual process, results, and harvest recommendations for 2023 using the revised ARM Framework. The Virginia Tech Trawl Survey estimates are used in the CMSA along with the NJ Ocean Trawl and the DE Fish and Wildlife Adult Trawl (30') Surveys. All quantifiable sources of mortality (i.e., bait harvest, biomedical mortality, and commercial dead discards) were used in the CMSA to estimate male and female horseshoe crab population sizes. Public population estimates for horseshoe crabs were made using the coastwide biomedical data or no biomedical data, which provide upper and lower bounds. The exact harvest recommendation is based on the results using confidential biomedical data from the Delaware Bay region and cannot be publicly shared. The exact recommended male and female harvest levels are rounded down to protect confidential data.

In the Delaware Bay region in 2021, there were approximately 15.9-16.0 million mature male and 6.0-6.1 million mature female horseshoe crabs (the range represents the difference between using coastwide and no biomedical data). The 2021 red knot population estimate was

42,271. Harvest recommendations for the 2023 fishing year made using the ARM Revision are based on CMSA estimates of horseshoe crab abundance and the red knot mark-resight abundance estimate in 2021. The maximum possible harvest for both females and males are maintained from the previous ARM Framework at 210,000 and 500,000, respectively.

Two options were given in draft Addendum VIII which were to round down the optimal harvest to the nearest 25,000 or 50,000 crabs to uphold data confidentiality. Two harvest recommendations, one using each rounding option, have been provided below based on an optimal harvest level given horseshoe crab abundance and red knot abundance in 2021. If the Board chooses to use the 2021 ARM Revision to set Delaware Bay bait harvest specifications as proposed in Draft Addendum VIII, it may select one of the options provided below.

Using sub-option B1 to round down to the nearest 25,000	
Male harvest	Female harvest
475,000	125,000

Using sub-option B2 to round down to the nearest 50,000	
Male harvest	Female harvest
450,000	100,000

5. Board Recommendation

The ARM Subcommittee and DBETC recommend using the revised ARM to set the Delaware Bay bait harvest specifications for 2023. This would result in one of the two sets of harvest levels presented above, depending on the options selected by the Board when they consider approval of Draft Addendum VIII.

The allocation methodology that would be used to distribute the Delaware Bay-origin quota amongst the states of New Jersey, Delaware, Maryland, and Virginia is specified in Addendum VII, and maintained in Draft Addendum VIII. However, the committees discussed an issue regarding Maryland’s total allocation, which includes non-Delaware Bay-origin crabs. Specifically, in order for Maryland to not exceed its Delaware Bay allocation of males and females, the state’s total harvest quotas must maintain the same sex ratio as the ARM recommendation. This has not previously been discussed by the ARM Subcommittee and DBETC because until this year the ARM has recommended zero female harvest, restricting Maryland’s total quota to male-only harvest. The state allocations recommended by the committees for 2023 are consistent with the proposed methodology in Addendum VIII and ensure the Delaware Bay-origin quota would not be exceeded (see Table 1 of the memo to the Board from the ARM Subcommittee and DBETC dated October 20, 2022).

One committee member felt the quota caps for MD and VA that were established in Addendum VII should be removed. They argued that the caps do not reflect the present abundance of horseshoe crabs, nor do they allow for the proper allocation of total quota among the four states.

The committees also recommended that for the Delaware Bay states, horseshoe crab harvest should not be allowed before June 7. Addendum III established a closed season for bait harvest of horseshoe crabs in and around the Delaware during peak horseshoe crab spawning that prohibited harvest and landings of horseshoe crabs in New Jersey, Delaware and Maryland from May 1 through June 7, inclusive. Addendum IV carried forward this requirement and also prohibited the landing of horseshoe crabs in Virginia from federal waters from January 1 through June 7. June 7 was chosen as the end of the closure as this is the date when most of the migrating shorebirds have left the Delaware bay region. However, Addendum VII did not include the seasonal closure for the Delaware Bay region. Re-establishment of this requirement would offer protection to spawning horseshoe crabs as well as reduce disturbance to migrating shorebirds foraging on the beaches. This requirement would be especially important if female harvest is going to be allowed. Current state regulations do prohibit harvest of Delaware Bay-origin horseshoe crab from January 1 through June 7.

6. Other Business

There was no additional discussion beyond the agenda items. No public comments were provided.

Results of the 2021 Horseshoe Crab Trawl Survey:

Report to the Atlantic States Marine Fisheries Commission Horseshoe Crab and Delaware Bay Ecology Technical Committees

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Abstract

With the continued growth of the mid-Atlantic horseshoe crab (*Limulus polyphemus*) fishery, annual analyses of the population dynamics of key demographic groups are needed for appropriate management. We conducted a trawl survey within the lower Delaware Bay and along the coast of the Delaware Bay area (Virginia to New Jersey), quantified mean catch per 15-minute tow, and compared relative abundance of demographic groups with those of prior years. Analysis of this year's data resulted in the highest mean stratified catch-per-tow values within the Delaware Bay Area over the time series for mature males, mature females, and newly mature males. These values were higher than last year's values for all demographic groups when a normal distribution was assumed for observations in each stratum. Mean stratified catch-per-tow for all demographic groups in the Delaware Bay Area continues to be highly variable, although mature individuals have shown a positive trend over the time series. Newly mature males also appear to show a slightly positive trend since 2002. Prosomal widths of all demographic groups, except immature females, show decreasing trends over the time series in the DBA. Our findings will be used to parameterize the Adaptive Resource Management model used to set annual harvest levels for horseshoe crabs.

Introduction

To effectively manage the mid-Atlantic horseshoe crab (*Limulus polyphemus*) fishery, accurate information on relative abundance levels and trends is needed. The Adaptive Resource Management model (McGowan et al. 2011) adopted by the ASMFC requires annual, fishery-independent indices of newly-mature recruit and adult abundances. The purpose of this project was to conduct a horseshoe crab trawl survey along the Mid-Atlantic coast in order to: (1) determine horseshoe crab relative abundance, (2) describe horseshoe crab population demographics, and (3) track inter-annual changes in horseshoe crab relative abundance and demographics. Here, we report our cumulative results through the fall 2021 trawl survey.

We have provided the Adaptive Resource Management (ARM) Subcommittee relative abundance estimates of horseshoe crabs in the DBA and LDB surveys to inform the ARM model runs.

Herein, we present the population estimates through the 2021 survey. Gear catchability has not been evaluated for these estimates, so they should be considered conservative.

Methods

The 2021 horseshoe crab trawl survey was conducted in two areas (Figure 1). The coastal Delaware Bay area (DBA) survey extended in the Atlantic Ocean from shore out to 22.2 km (12 nautical miles), and from 39° 20' N (Atlantic City, NJ) to 37° 40' N (slightly north of Wachapreague, VA). This area was previously sampled from 2002 to 2011, and again from 2016 to 2021. The lower Delaware Bay (LDB) survey area extended from the Bay mouth to a line between Egg Island Point, New Jersey and Kitts Hummock, Delaware. The LDB was previously sampled from 2010 to 2012 and in 2016- 2021. The surveys were conducted between 10 August to 25 September 2021.

The DBA survey area was stratified by distance from shore (0-3 nm, 3-12 nm) and bottom topography (trough, non-trough) as in previous years. The LDB survey area was stratified by bottom topography only, as in previous years. Sampling was conducted aboard a 16.8-m chartered commercial fishing vessel operated out of Ocean City, MD. We used a two-seam flounder trawl with an 18.3-m headrope and 24.4-m footrope, rigged with a Texas Sweep of 13-mm link chain and a tickler chain. The net body consisted of 15.2-cm (6-in) stretched mesh, and the bag consisted of 14.3-cm (5 5/8-in) stretched mesh. Tows were usually 15-minutes bottom time, but were occasionally shorter to avoid fishing gear (e.g., gill nets, crab and whelk pots) or vessel traffic. Start and end positions of each tow were recorded when the winches were stopped and when retrieval began, respectively. Bottom water temperature was recorded for each tow. We sampled 43 stations in the DBA survey and 2 stations in the LDB. Two of the trawls in the DBA were shorter in duration than average, a five-minute tow within our inshore/trough strata and a six-minute tow within our inshore/not-trough strata. We decided to include data from these trawls in our analysis as they did not involve net malfunctions and hence still should provide valuable data. Additionally, due to the high variance in CPUE and density of HSCs in each stratum (Figure 2), a larger sample size will help better explain this variability.

Horseshoe crabs were culled from the catch, and either all individuals or a subsample were examined for prosomal width (PW, millimeters) and identified for sex and maturity. Maturity classifications were: immature, newly mature (those that are capable of spawning but have not yet spawned), and mature (those that have previously spawned). Newly mature and mature males are morphologically distinct and are believed to be classifiable without error. However, some error is associated with distinguishing newly mature from immature females. All examined females that were not obviously mature (i.e., bearing rub marks) or immature (too small or soft-shelled) were probed with an awl to determine presence or absence of eggs. Females with eggs but without rub marks were considered newly mature. Females with both eggs and rub marks were considered mature. Initial sorting classifications were: presumed adult males (newly mature and mature), presumed adult females, and all immature. Up to 25 adult males, 25 adult females, and 50 immatures were retained for examination. The remainder were counted separately by classification and released. Characteristics of the examined subsamples were then extrapolated to the counted portions of the catch

In each stratum, the mean catch per 15-minute tow and associated variance were calculated using two methods, i.e., either assuming a normal-distribution model or a delta-lognormal distribution

model (Pennington, 1983). Stratum mean and variance estimates were combined using formulas for a stratified random sampling design (Cochran, 1977). The approximate 95% confidence intervals were calculated using the effective degrees of freedom (Cochran, 1977). Annual means were considered significantly different if 95% confidence limits did not overlap. Stratified means calculated using the delta-lognormal distribution model are not additive - i.e., means calculated for each demographic group do not sum to the mean calculated using all crabs. Means calculated using the normal-distribution model are additive, within rounding errors.

Annual size-frequency distributions, in intervals of 10-mm prosomal width, were calculated for each sex/maturity category by pooling size-frequency distributions of all stations (adjusted for tow duration if necessary) in a stratum in a year to determine the relative proportions for each size interval. Those proportions then were multiplied by the stratum mean catch-per-tow that year to produce a stratum size-frequency distribution. Stratum size-frequency distributions then were multiplied by the stratum weights and added in the same manner as calculating the stratified mean catch per tow. Areas under the distribution curves represent the stratified mean catch per tow at each size interval.

Within the DBA, excluding the two shorter trawls, the average tow distance for a 15-min tow was 1.5 kilometers at a speed of 4.79 KPH. Respectively, LDB 15-min tows averaged 1.3 kilometers at a speed of 3.61 KPH. No net-spread measurement device was used during sampling. Instead, net-spread was calculated using the net-spread regression relationship, *net spread (S, in meters)/tow speed (C, in KPH)*, developed from previous trawl surveys ($S = 13.84 - 0.858 \times C$). From our combined 43 tows, the average net-spread was 8.7 meters.

For each tow, catch density (catch/km²) was calculated from the product of tow distance (in km) and estimated net-spread (converted from meters to km) assuming that all fishing was done only by the net, and that there was no herding effect from the ground gear (sweeps):

$$\text{catch/km}^2 = \text{catch}/[\text{tow distance (km)} \times \text{net-spread (km)}].$$

Within each stratum, the mean catch per square-kilometer and associated variance were calculated assuming a normal-distribution model and a lognormal delta-distribution model. Stratum mean densities and variance estimates were combined to produce a stratified mean density (\bar{X}_{st}) using formulas for a stratified random sampling design as with the catch-per-tow estimates described above. Population totals were estimated by multiplying stratified mean density (\bar{X}_{st}) by survey area (DBA = 5127.1 km²; LDB = 528.4 km²):

$$\text{Population total} = \bar{X}_{st} \times (5127.1 \text{ or } 528.4 \text{ km}^2)$$

Results

Delaware Bay Area

For all demographic groups other than newly mature males, mean stratified catch-per-tow values have remained relatively consistent between 2016 and 2018. Since then, there has been a substantial increase in variation over the past three years (Tables 1 and 2; Figure 3). While the mean stratified catches-per-tow for immature individuals decreased compared to last year, mature males and

females, as well as newly mature males, have all seen an increase in their mean values. There were no newly mature females caught in any trawls within the Delaware Bay Area.

There is a significant correlation between stratified mean catches of mature males and mature females ($r = 0.94$; $p < 0.001$; $T = 10.868$; $n = 16$) when considering all data since 2002. This is also true for immature males and females ($r = 0.98$; $p < 0.001$; $T = 18.78$; $n = 16$), but not for newly mature individuals. This is similar to results found in last year's report that found a significant correlation between newly mature individuals between 2002 – 2018. However, this correlation was lost with the addition of data from 2019 and 2020. This is likely due to the relatively low number of newly mature males and females trawled in these years. For example, in 2021, newly mature males were caught in only 24% of all trawls performed, for a total of 408 individuals, compared to mature males which were caught in 80% of the forty-five trawls performed this year, for a total of 17,206 individuals.

Lower Delaware Bay

Sampling within the lower Delaware Bay started in 2010 and this year marked the ninth year of trawling this area, with a gap in sampling between 2013-2015. Since 2016, there has been a relative decrease in the mean relative abundances of almost all demographic groups in the LDB except newly mature females which have remained consistently low. The mean stratified catch-per-tow increased significantly from last year for immature females, immature males, and mature females (Tables 3 and 4; Figure 4). This could be due to the overall low number of trawls performed in the LDB, leading to an unrepresentative sample of the population. No newly mature females have been trawled in the LDB since 2018, and this year, no newly mature males were caught. This year presents the lowest mean value for newly mature males in the time series. There was a significant correlation between mean catches of mature males and females ($r = 0.91$; $p < 0.001$; $T = 5.9831$; $n = 9$) along with immature males and females ($r = 0.97$; $p < 0.001$; $T = 11.513$; $n = 9$).

Size distribution

Similar to last year's report, size-frequency distributions remain highly variable (Figure 5). There were no distinct modal groups simultaneously in both sexes other than in 2009 with immature individuals. However, this modal group did not continue into the following years and was not found within the lower Delaware Bay (Figure 6).

We had previously reported that mean prosomal widths of mature and newly mature male and female crabs in the DBA survey displayed slight, but detectable, decreases over time (Table 5, Figure 7) (Hata and Hallerman 2017, 2019, Hallerman and Jiao 2020). Since we were unable to sample any newly mature individuals, we are unable to determine whether this trend has continued. Otherwise, there still appears to be a decrease in mean prosomal width in mature males and females in the DBA and LDB, as well as amongst newly mature males in the DBA.

Sex ratios

Overall, mature males were generally twice as common as mature females throughout the sampling period. Sex ratios (M:F) from mean catch-per-tow within the DBA ranged from 1.6 in 2021 to 3.64 in 2016, with an average of 2.50 over the time series. Male to female sex ratios in newly mature individuals have been highly variable, ranging from 0.11 in 2003 to 5.6 in 2019, with a new overall average of 1.68 over the time series. This may reflect sampling effects, temporal variability in

recruitment to the newly mature class relative to survey period, or differences in year-class abundance because females are believed to mature a year later than males.

Compared to the coast, the lower Delaware Bay continues to have a much higher male to female sex ratio in mature individuals. These values for mature individuals have ranged from 2.60 in 2018 to 6.15 in 2016, with a new average of 3.94. This relationship between the coast and bay has been historically similar for newly mature individuals, with a low of 0.45 in 2010 and high of 6.10 in 2012. Excluding 2019 and 2020 — where newly mature males were caught but no newly mature females — this led to an average of 3.09. Since no newly mature crabs of either sex were caught this sampling season, we cannot update this further. The higher sex ratios within Delaware Bay may reflect a tendency for male horseshoe crabs to remain near the spawning beaches.

Population estimates

Annual population estimates of immature crabs in the DBA survey mirror trends observed in the catch-per-tow estimates and have been variable over time, with a large peak in 2009 (Tables 6 and 7). This shows that for immature individuals, the estimated mean population total decreased, while for mature individuals, and newly mature males, there appears to be an increase. The only minor difference between this and the catch-per-tow estimates is that this increase is significant for both newly mature males *and* mature females, rather than just newly mature males. Assuming the normal distribution, the significance found in catch-per-tow estimates is mirrored in population total estimates. Similarly, these mean population total estimates are the highest seen for mature individuals and newly mature males in the time series. Estimated numbers of mature males and females have generally been higher since 2006. There is a significant correlation between population estimates for mature males and females ($r = 0.95$; $p < 0.001$; $T = 11.61$; $n = 16$) and immature males and females ($r = 0.99$; $p < 0.001$; $T = 32.06$; $n = 16$), as observed in mean catches per tow above. There is no significant correlation amongst newly mature individuals in the DBA.

Population estimates within the lower Delaware Bay have reflected those seen in the Delaware Bay Area (Tables 8 and 9). Despite the LDB representing only 9.3% of the entire sampling area, 19.4% of immature males and 15.3% of immature females have been collected in this area over the time series. In 2021, only 5.2% of immature males and 3% immature females were collected within the lower Delaware Bay. Proportions of newly mature crabs within the LDB compared to the DBA are most similar to what one would expect based on the sample area that the LDB represents within the total available sampling area. Newly mature females from the LDB on average represent only 4.8% of the total population during the time series, along with newly mature males representing only 7.3%. No immature males or females were caught inside the LDB in 2021. On average, only 16% of mature males and 11% of mature females occurred within the lower Delaware Bay. In our 2021 sampling, less than 1% of mature males, and mature females, were caught in the LDB. This low representation of mature individuals within the lower Delaware Bay is likely due to grown, mature individuals moving offshore towards the continental shelf, away from nursery grounds.

Effects of sampling period estimates

Sampling in the Delaware Bay Area occurred primarily during August, with the last two of forty-one trawls occurring in the beginning of September. This is much earlier than all sampling years prior to 2019. This resulted in a generally high average water temperature compared to sampling before 2016,

though very similar to the past five years (Table 10; Figure 8). The two trawls within the lower Delaware Bay occurred at the end of September, which is later than last year, but closer to all previous year averages. Within the lower Delaware Bay, average water temperature is more directly inversely proportional to the ordinal date than it is within the DBA. This holds true for 2021 where the temperature within the LDB was lower than last year, closer to the lows seen in years prior to 2020.

When comparing water temperature and the time of our sampling period, there appears to be a correlation within the DBA of mean catches-per-tow of immature males and females with both water temperature ($p = 0.028$, $p = 0.032$) and ordinal date ($p = 0.017$, $p = 0.022$). This is also seen in mature males ($p_{temp} = 0.02$, $p_{date} = 0.002$) and females ($p_{temp} = 0.023$, $p_{date} = 0.002$). For newly mature males and females, there seems to be a correlation with only ordinal date ($p = 0.049$, $p = 0.044$). In the LDB, there are no significant ($p < 0.05$) correlations of mean catches-per-tow with temperature or date in any demographic groups (Table 11).

Key Findings

1. Mean stratified catches-per-tow were at their highest point in the time series for mature males, mature females, and newly mature males.
2. Mean catch-per-tow of immature male and female horseshoe crabs in the coastal Delaware Bay area have remained variable since 2002 and have no apparent trend.
3. Mean catch-per-tow of newly mature male horseshoe crabs in the coastal Delaware Bay area remained highly variable, with newly mature males showing a minor positive trend over the study period, while newly mature females have remained relatively low since 2019.
4. Mean catch-per-tow of mature male and female horseshoe crabs in the coastal Delaware Bay area continue to be highly variable, with their highest points in 2021, showing a positive trend over the time series.
5. Mean catch-per-tow of all demographic groups may be correlated with ordinal date. Mean catch-per-tow of immature and mature individuals may be correlated with temperature.
6. Mean prosomal width appears to still be decreasing in mature and newly mature males and females in the DBA, along with immature males.

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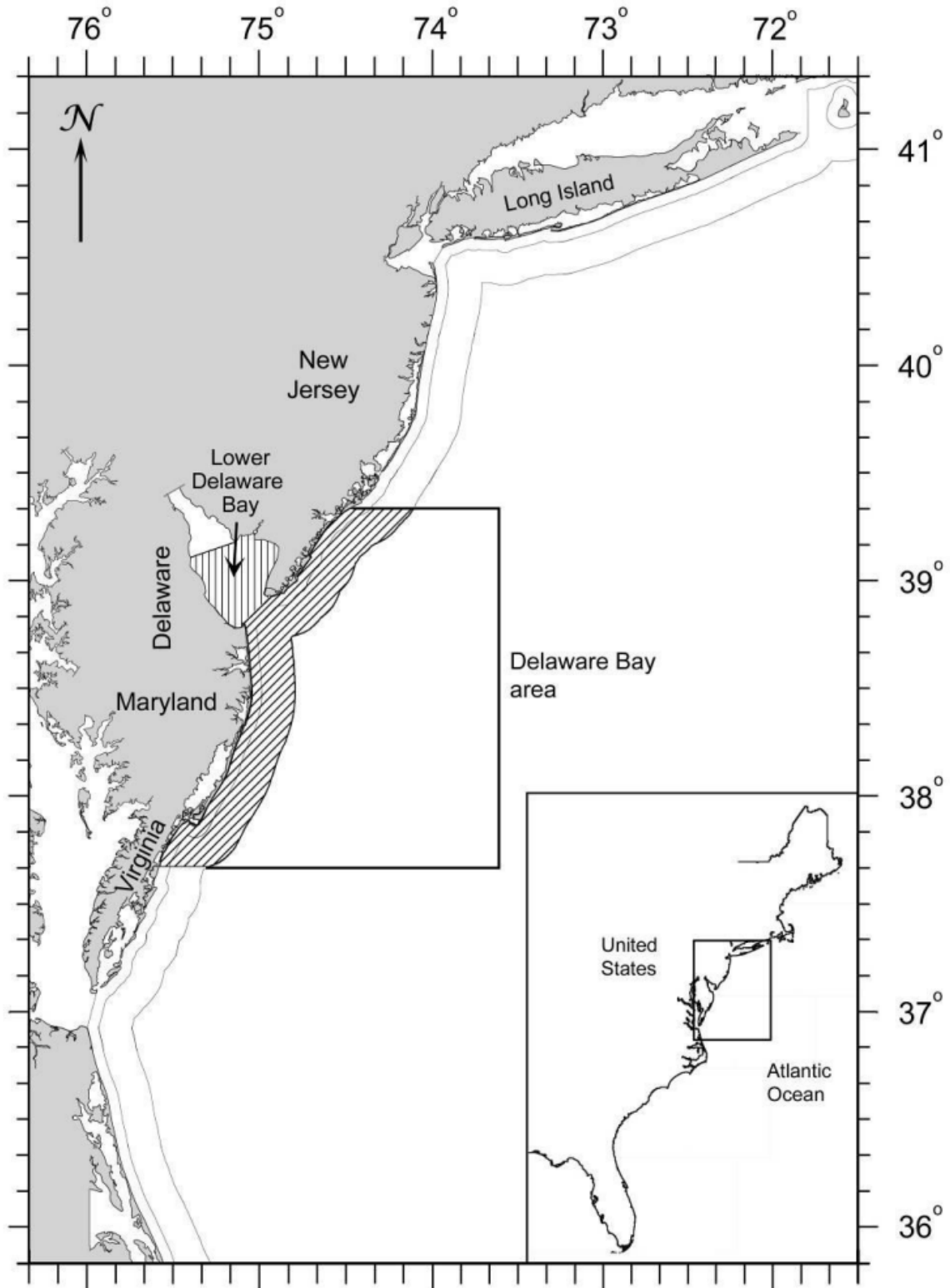


Figure 1. Fall 2020 horseshoe crab trawl survey sampling area. The coastal Delaware Bay area (DBA) and Lower Delaware Bay (LDB) survey areas are indicated. Mean catches between years were compared using stations within the shaded portions of the survey areas.

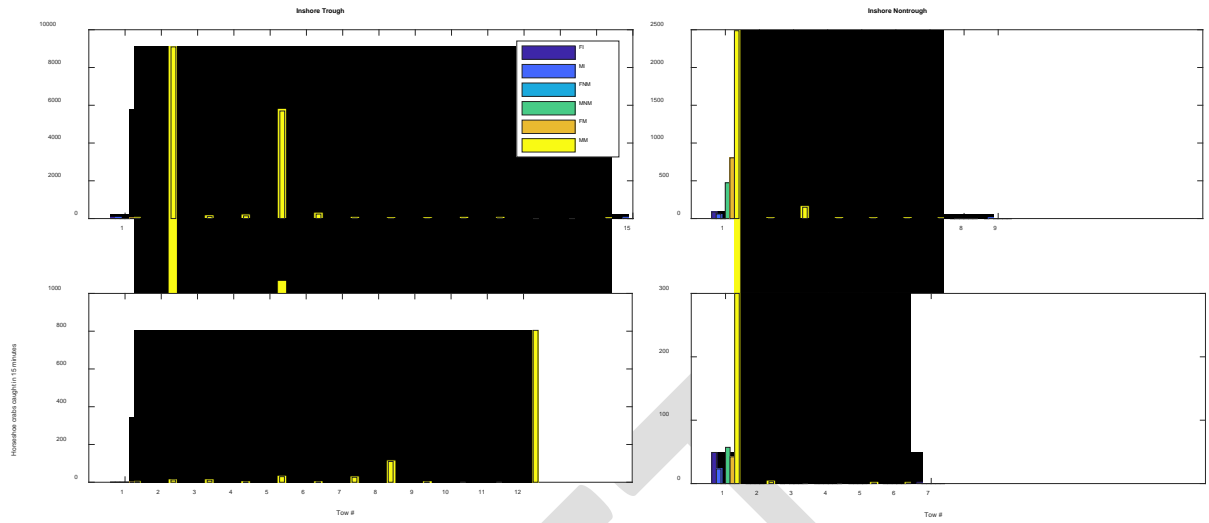


Figure 2. Plots showing high variability of relative abundances of horseshoe crabs of different demographic groups caught within the same strata in fifteen-minute tows in 2020.

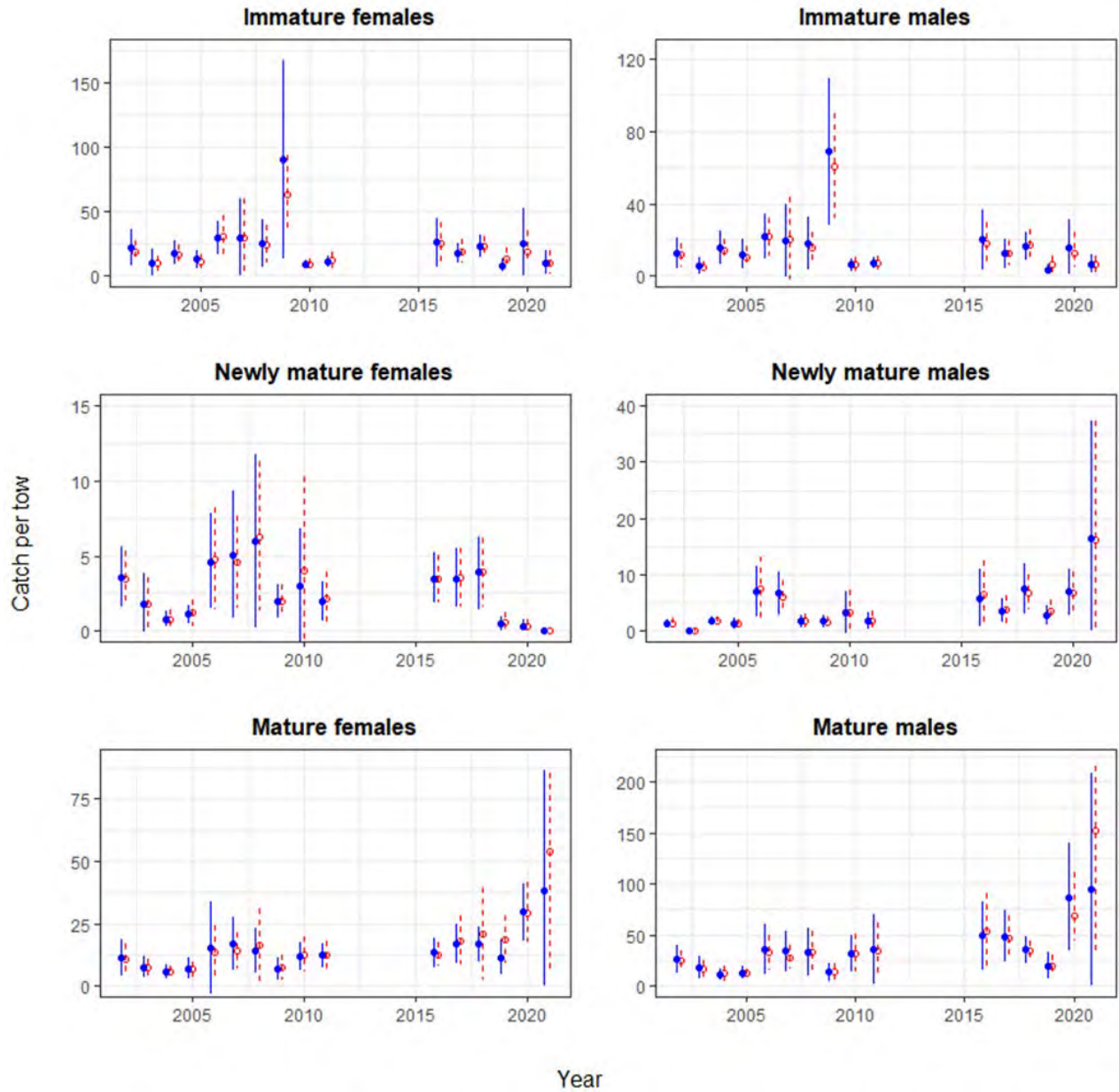


Figure 3. Plots of stratified mean catches per 15-minute tow of horseshoe crabs in the coastal **Delaware Bay** area survey by demographic group. Vertical lines indicate 95% confidence intervals. Solid blue symbols and lines indicate the **delta distribution** model. Open red symbols and dashed lines indicate the **normal distribution** model. Data are from Tables 1 and 2. Note the differences in the y-axis scales.

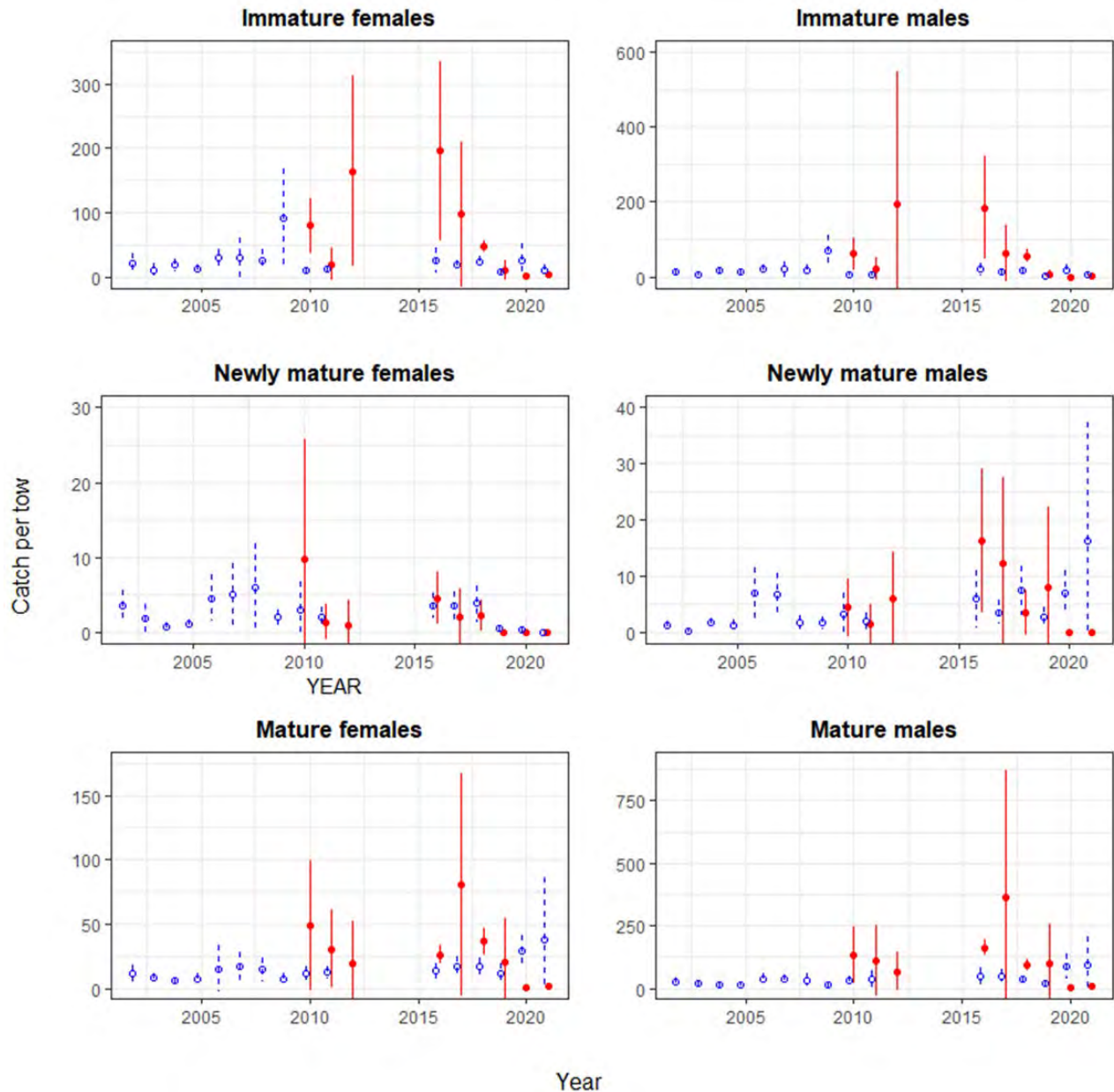


Figure 4. Plots of stratified mean catches per 15-minute tow of horseshoe crabs in the **lower Delaware Bay** survey by demographic group, with coastal **Delaware Bay area** survey means for comparison. Vertical lines indicate 95% confidence limits. Only the **delta distribution** model means are presented for clarity. Solid symbols and lines indicate **the lower Delaware Bay survey**. Open symbols and dashed lines indicate the coastal **Delaware Bay area** survey. Note differences in y-axis scales.

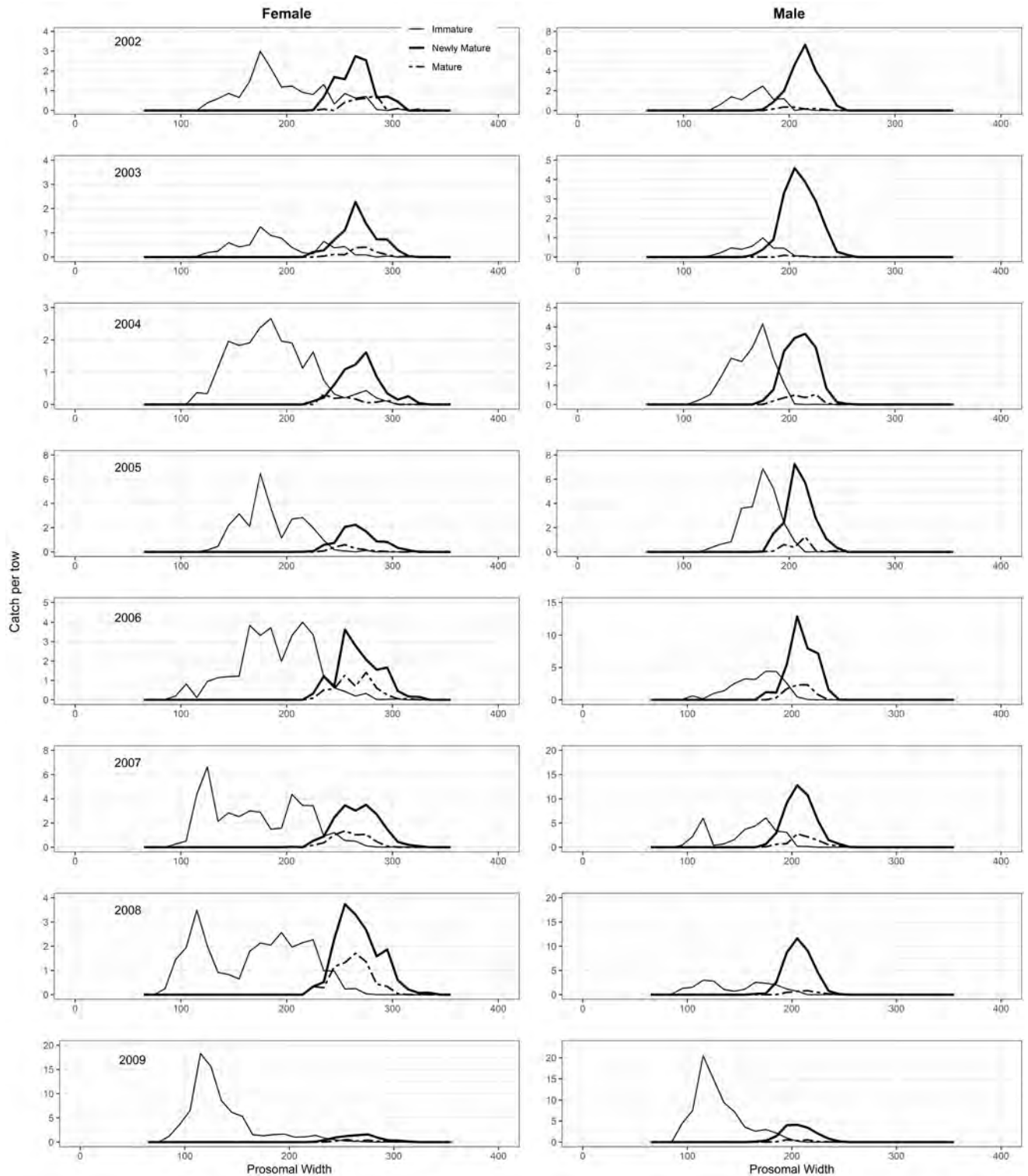


Figure 5. Relative size-frequency distributions of horseshoe crabs by demographic group and year in the coastal **Delaware Bay area** trawl survey. Relative frequencies are scaled to represent stratified mean catches in Table 1.

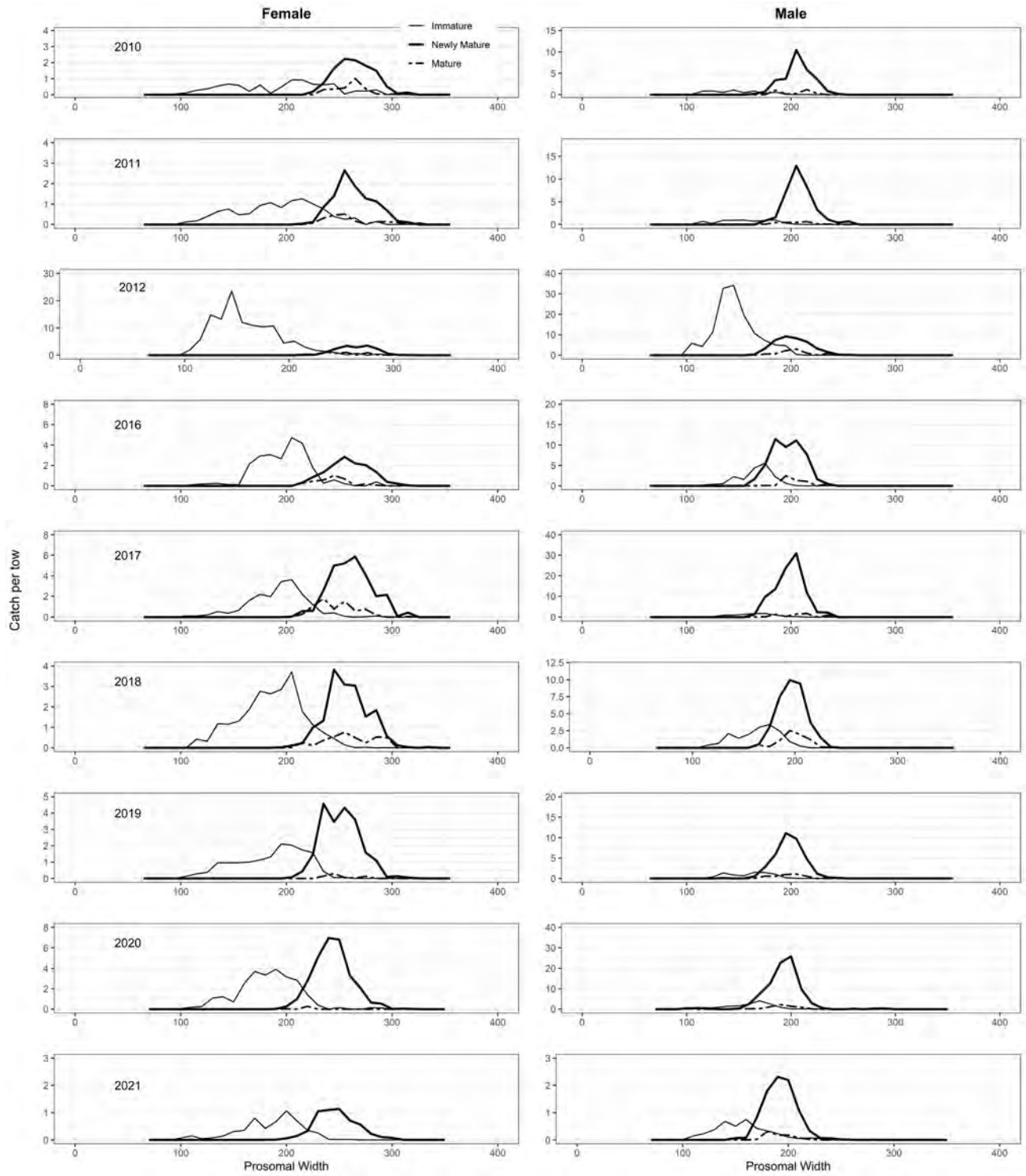


Figure 5. continued.

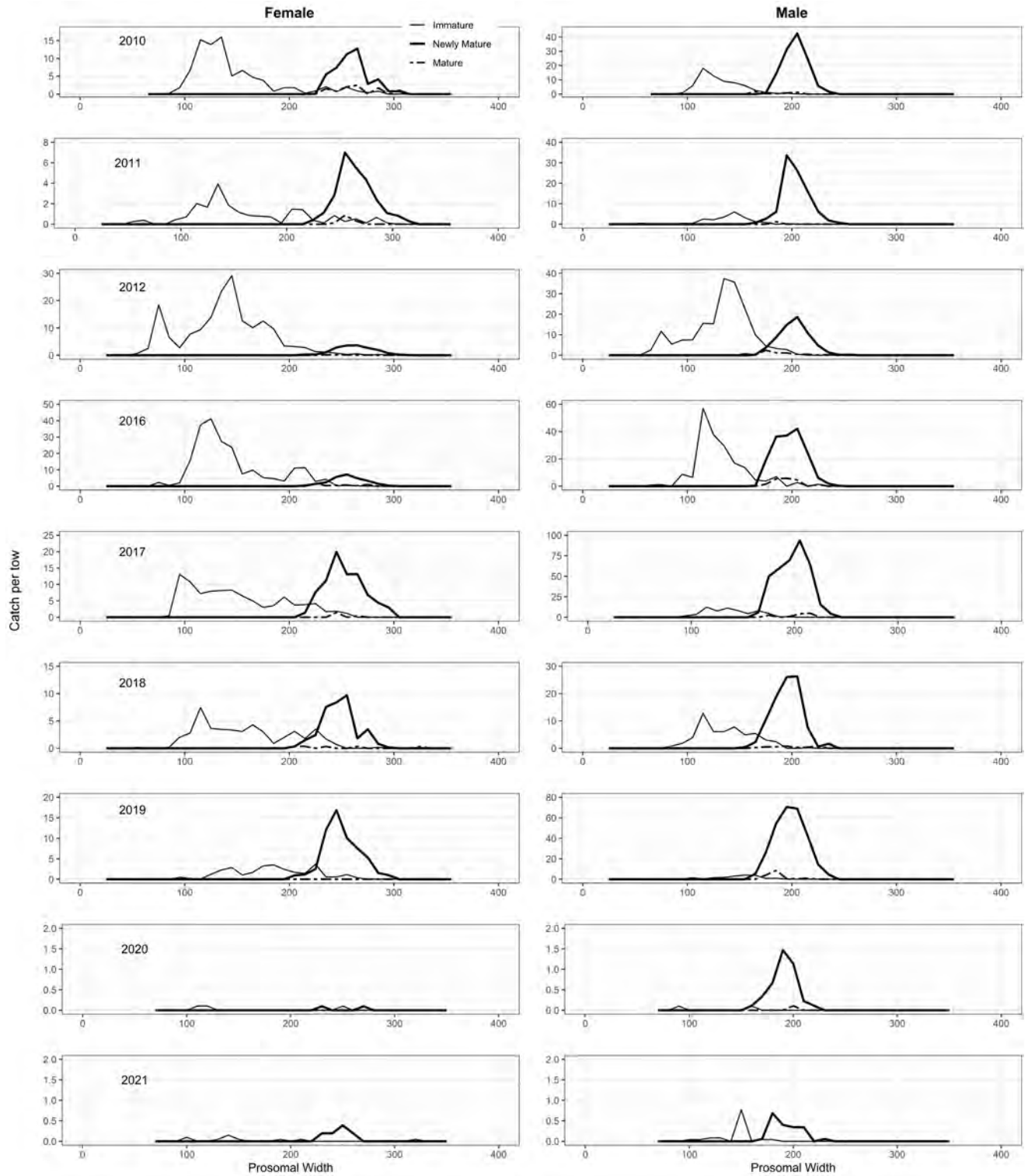


Figure 6. Relative size-frequency distributions of horseshoe crabs by demographic group and year in the **lower Delaware Bay** trawl survey. Relative frequencies are scaled to represent stratified mean catches in Table 3.

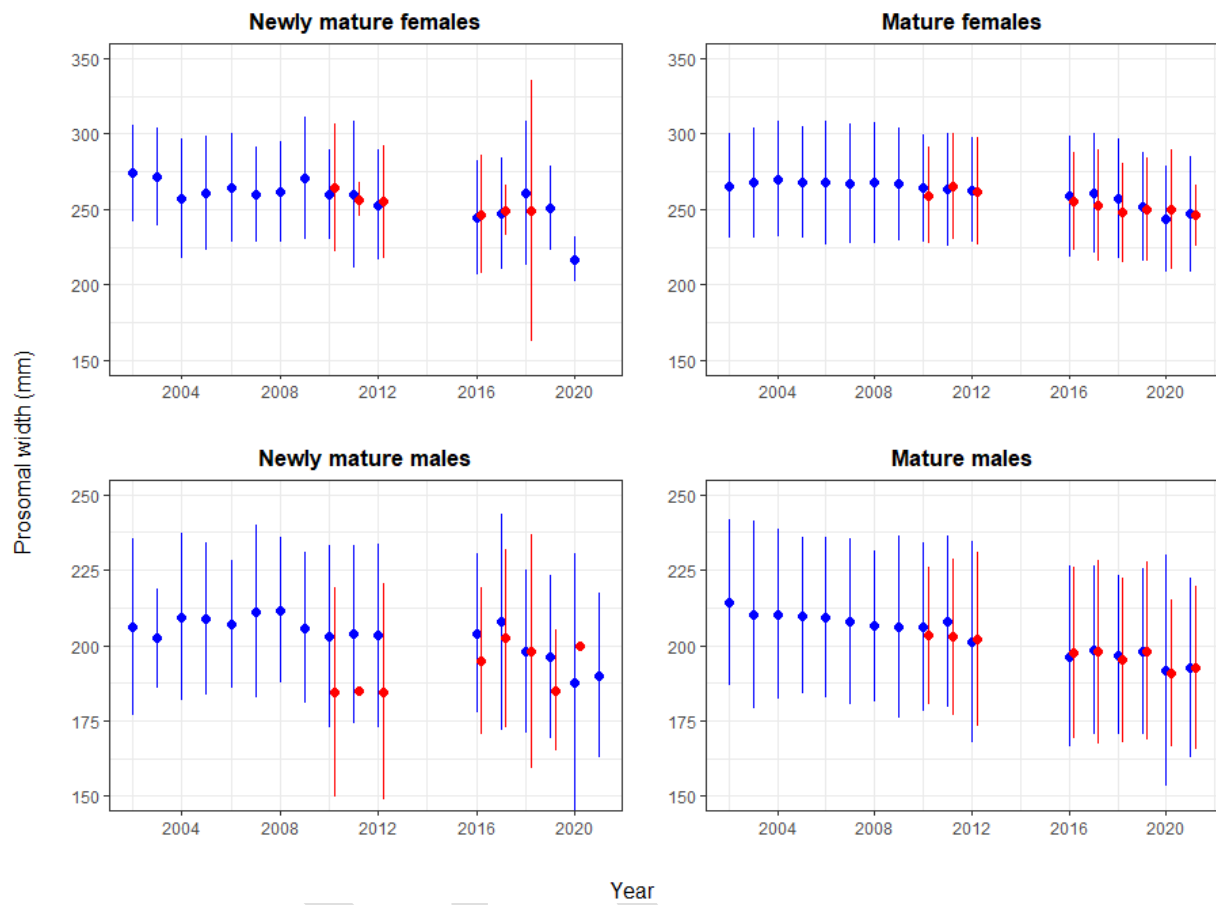


Figure 7. Mean prosomal widths (mm) (± 2 standard deviations) of mature and newly mature female and male horseshoe crabs in the Delaware Bay area (blue symbols and lines) and lower Delaware Bay (red symbols and lines) surveys.

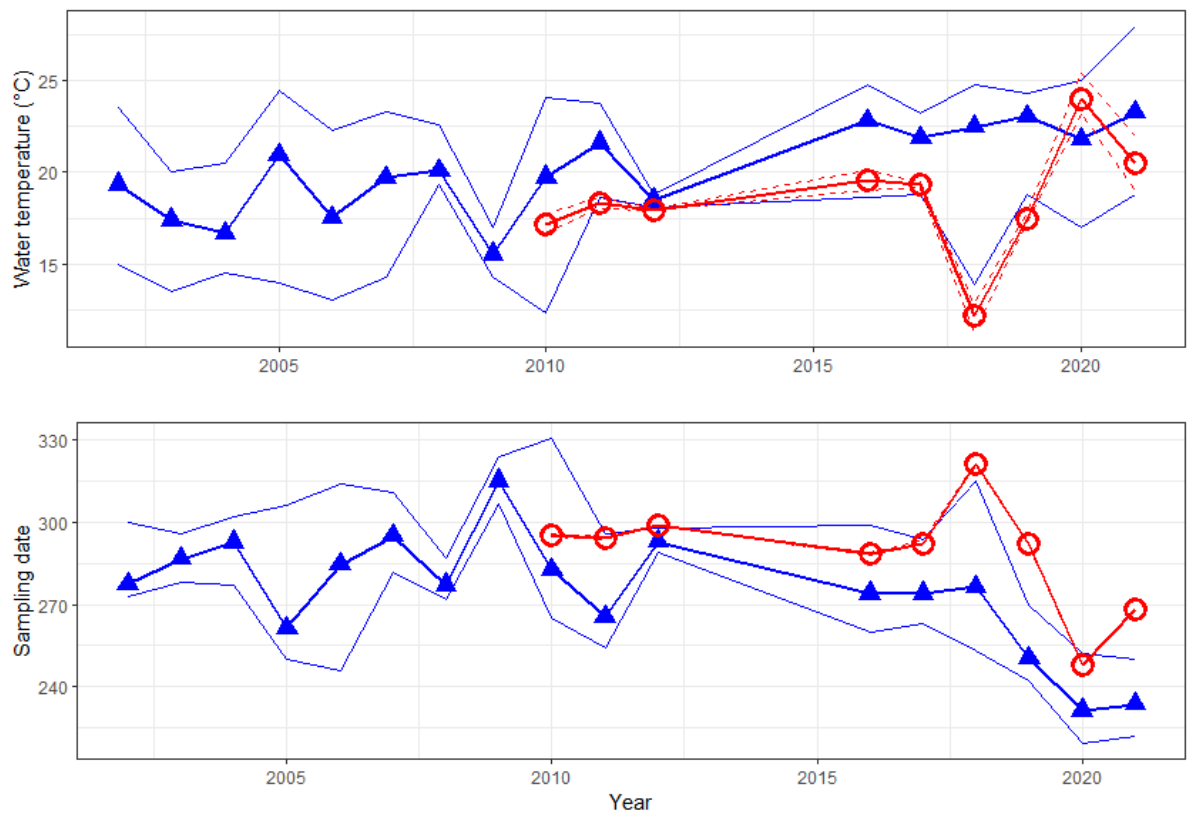


Figure 8. Plots of bottom water temperatures and ordinal sampling dates (days since 1 January) in the coastal Delaware Bay area and lower Delaware Bay trawl surveys. Solid symbols and blue lines indicate coastal Delaware Bay area. Open symbols and red lines indicate lower Delaware Bay. Points indicate mean values. Thinner lines indicate maximum and minimum values. Approximate calendar dates are indicated by gray horizontal lines for reference (ordinal dates are shifted by one day for leap years).

Table 1. Stratified mean catch-per-tow of horseshoe crabs in the coastal **Delaware Bay area** survey, 2002-2021, with the mean, standard deviation (sd), and coefficient of variation (CV), calculated using the **delta distribution** model by demographic group. Also included are the estimated upper and lower 95% confidence limits (UCL, LCL).

YEAR	MEAN	UCL	LCL	CV	SD	YEAR	MEAN	UCL	LCL	CV	SD
Immature Females						Immature Males					
2002	21.9	36.1	7.6	0.31	6.8	2002	12.6	21.4	3.9	0.33	4.2
2003	10.5	20.4	0.7	0.43	4.6	2003	5.4	9.9	0.9	0.39	2.1
2004	17.9	27.2	8.6	0.25	4.5	2004	15.7	25	6.4	0.29	4.5
2005	12.7	19.9	5.5	0.28	3.5	2005	11.9	20	3.8	0.33	3.9
2006	29.5	42.8	16.3	0.21	6.3	2006	21.6	33.9	9.2	0.25	5.4
2007	29.6	59.4	-0.2	0.41	12.2	2007	19.5	39.6	-0.6	0.42	8.2
2008	25.3	43.7	6.9	0.33	8.3	2008	18	32.4	3.6	0.35	6.3
2009	90.2	167.4	12.9	0.39	35.5	2009	69	109.7	28.3	0.29	19.8
2010	9	11.9	6.1	0.16	1.4	2010	6.1	9.5	2.8	0.27	1.6
2011	11.4	15.9	6.9	0.19	2.2	2011	6.9	10.1	3.7	0.23	1.6
2016	25.8	45.1	6.5	0.36	9.2	2016	20	36.6	3.5	0.39	7.9
2017	17.9	25.4	10.4	0.19	3.4	2017	12.3	20.5	4.2	0.27	3.3
2018	22.5	31.2	13.9	0.18	4.1	2018	16.5	24.4	8.7	0.22	3.7
2019	8	12.7	3.2	0.3	2.4	2019	3.5	6	1	0.35	1.2
2020	25.3	51.9	0.1	0.6	15.2	2020	16	31.3	0.8	0.56	9.1
2021	10.4	19.8	1.1	0.52	5.5	2021	6.4	11.5	1.3	0.46	3
Mature Females						Mature Males					
2002	11.4	18.5	4.2	0.3	3.4	2002	26.6	39.7	13.4	0.24	6.3
2003	7.7	11.7	3.7	0.25	1.9	2003	18.4	29.6	7.3	0.28	5.2
2004	5.9	8.6	3.3	0.21	1.3	2004	11.4	17.1	5.7	0.24	2.8
2005	7.2	11.4	3	0.27	2	2005	13.2	19.1	7.3	0.21	2.8
2006	15.3	33.8	-3.2	0.44	6.7	2006	36.2	60.9	11.4	0.28	10.1
2007	16.9	27.5	6.2	0.3	5.1	2007	34.3	54.4	14.3	0.28	9.7
2008	14.4	23.3	5.4	0.29	4.2	2008	33.5	57.2	9.8	0.33	11.2
2009	6.7	11.2	2.3	0.32	2.1	2009	14.1	22.8	5.3	0.3	4.2
2010	11.8	17.3	6.3	0.22	2.6	2010	31.5	49.2	13.8	0.27	8.6
2011	12.3	17.1	7.6	0.18	2.2	2011	36	69.8	2.2	0.41	14.7
2016	13.5	19.5	7.6	0.21	2.9	2016	49.2	83.1	15.2	0.29	14.3
2017	16.9	24.8	9	0.23	3.9	2017	48.9	74	23.9	0.25	12.2
2018	16.8	23.7	9.9	0.2	3.3	2018	35.7	48.9	22.5	0.17	6.2
2019	11.6	18.7	4.5	0.3	3.5	2019	20	33.3	6.8	0.33	6.6
2020	29.6	41.2	18.1	0.23	6.9	2020	87	139.4	34.5	0.36	31.1
2021	38.2	86.5	0	0.72	27.42	2021	95	207.8	0	0.67	64.1
Newly Mature Females						Newly Mature Males					
2002	3.6	5.6	1.6	0.26	0.9	2002	1.3	2	0.5	0.28	0.4
2003	1.8	3.8	-0.1	0.49	0.9	2003	0.2	0.5	-0.1	0.84	0.2
2004	0.8	1.3	0.3	0.3	0.2	2004	1.8	2.6	1	0.21	0.4
2005	1.1	1.7	0.5	0.28	0.3	2005	1.3	2.3	0.4	0.33	0.4
2006	4.6	7.8	1.5	0.3	1.4	2006	7.1	11.6	2.6	0.36	2.7
2007	5.1	9.3	0.9	0.39	2	2007	6.7	10.6	2.8	0.28	1.9
2008	6	11.8	0.2	0.44	2.7	2008	1.8	2.9	0.6	0.32	0.6
2009	2	3.1	0.9	0.26	0.5	2009	1.7	2.8	0.5	0.34	0.6
2010	3	6.8	-0.7	0.59	1.8	2010	3.2	7	-0.5	0.55	1.8
2011	2	3.3	0.7	0.31	0.6	2011	1.9	3.4	0.4	0.37	0.7
2016	3.5	5.2	1.9	0.23	0.8	2016	5.9	11	0.7	0.42	2.5
2017	3.5	5.5	1.6	0.27	0.9	2017	3.6	5.8	1.5	0.29	1
2018	3.9	6.3	1.4	0.3	1.2	2018	7.5	11.9	3.1	0.27	2.1
2019	0.5	1	0	0.46	0.2	2019	2.8	4.6	1	0.32	0.9
2020	0.3	0.8	0	0.85	0.3	2020	7	11	2.9	0.35	2.4
2021	0	NA	NA	NA	0	2021	16.4	37.3	0	0.69	11.3

Table 2. Stratified mean catch-per-tow of horseshoe crabs in the coastal **Delaware Bay area** survey, 2002-2020, with the mean, standard deviation (sd), and coefficient of variation (CV), calculated using the **normal distribution** model by demographic group. Also included are the estimated upper and lower 95% confidence limits (UCL, LCL).

YEAR	MEAN	UCL	LCL	CV	SD	YEAR	MEAN	UCL	LCL	CV	SD
Immature Females						Immature Males					
2002	19.1	27.6	10.5	0.22	4.1	2002	11.7	18.3	5	0.27	3.2
2003	9.5	15.9	3	0.32	3.1	2003	4.9	8.1	1.8	0.3	1.5
2004	17	24.5	9.5	0.21	3.6	2004	14	20.3	7.6	0.22	3.1
2005	11.5	17	6.1	0.23	2.6	2005	10.6	16.7	4.4	0.28	2.9
2006	31.1	46.9	15.3	0.24	7.5	2006	21.5	32	11.1	0.23	5
2007	29.8	59.6	0	0.41	12.2	2007	20.5	43.2	-2.3	0.45	9.3
2008	24.6	38.9	10.3	0.27	6.6	2008	15.9	24.2	7.6	0.24	3.8
2009	63.1	93.8	32.4	0.24	14.9	2009	61	89.8	32.1	0.23	14
2010	9.4	13	5.7	0.19	1.8	2010	6.4	10.1	2.6	0.29	1.8
2011	12.2	18.5	6	0.25	3	2011	7.3	11.2	3.3	0.26	1.9
2016	25.1	41.1	9	0.31	7.7	2016	18.1	29.9	6.3	0.31	5.7
2017	19.1	28.7	9.6	0.24	4.6	2017	12.4	19.3	5.5	0.26	3.3
2018	22.5	30.6	14.5	0.17	3.8	2018	17.2	25.9	8.6	0.24	4.1
2019	13.7	21.9	5.5	0.3	4.1	2019	6.6	11.1	2	0.34	2.2
2020	18.8	35.4	8.7	0.32	6	2020	12.7	24	4.7	0.37	4.75
2021	10.14	19.20	1.54	0.50	5.05	2021	6.39	10.99	1.83	0.42	2.66
Mature Females						Mature Males					
2002	11	17	4.9	0.26	2.8	2002	24.6	34.4	14.8	0.19	4.7
2003	7.5	10.9	4.1	0.22	1.6	2003	17	24.7	9.4	0.21	3.6
2004	6	8.3	3.7	0.19	1.1	2004	12.6	20.2	5.1	0.29	3.6
2005	6.8	10	3.5	0.22	1.5	2005	12.3	16.7	7.8	0.17	2.1
2006	13.5	24.2	2.7	0.31	4.2	2006	32.8	49.5	16.1	0.22	7.4
2007	14.2	21.3	7.1	0.24	3.4	2007	28.4	39.9	16.8	0.2	5.6
2008	16.5	31	2	0.41	6.8	2008	32.7	53.7	11.7	0.31	10
2009	7.3	12.3	2.2	0.33	2.4	2009	14.2	22.9	5.5	0.29	4.1
2010	12.7	19.7	5.7	0.26	3.3	2010	32.5	50.9	14.1	0.27	8.8
2011	12.6	18.1	7.2	0.2	2.6	2011	35.4	61.4	9.5	0.32	11.5
2016	12.8	17.4	8.2	0.17	2.2	2016	53.9	90	17.8	0.3	16.2
2017	18.2	28	8.4	0.26	4.8	2017	47.2	69.3	25.1	0.23	10.8
2018	21.1	39.6	2.5	0.41	8.7	2018	34.9	44.9	24.9	0.14	4.8
2019	18.7	28.4	9	0.26	4.8	2019	19.7	31	8.4	0.28	5.6
2020	29.4	41.8	17.3	0.25	7.2	2020	68.8	111.7	44.1	0.21	14.7
2021	54.03	85.27	6.79	0.50	26.82	2021	152.63	215.49	30.01	0.46	69.66
Newly Mature Females						Newly Mature Males					
2002	3.5	5.3	1.7	0.24	0.9	2002	1.3	2.2	0.4	0.31	0.4
2003	1.8	3.6	0.1	0.45	0.8	2003	0.2	0.5	-0.2	0.84	0.2
2004	0.8	1.4	0.3	0.33	0.3	2004	1.8	2.6	1	0.21	0.4
2005	1.2	2.1	0.3	0.35	0.4	2005	1.3	2.1	0.5	0.29	0.4
2006	4.8	8.2	1.4	0.33	1.6	2006	7.5	13.2	1.8	0.36	2.7
2007	4.6	7.7	1.5	0.32	1.5	2007	6.1	9.1	3.2	0.23	1.4
2008	6.3	11.3	1.3	0.37	2.3	2008	1.8	3.1	0.5	0.34	0.6
2009	2	3.1	0.9	0.26	0.5	2009	1.6	2.6	0.6	0.3	0.5
2010	4	10.3	-2.3	0.74	3	2010	3.3	7.2	-0.6	0.56	1.9
2011	2.2	3.9	0.5	0.38	0.8	2011	1.9	3.5	0.4	0.38	0.7
2016	3.5	5.1	1.9	0.22	0.8	2016	6.6	12.6	0.6	0.43	2.9
2017	3.6	5.5	1.6	0.27	1	2017	3.8	6.4	1.3	0.32	1.2
2018	3.9	6.2	1.6	0.28	1.1	2018	6.9	10	3.9	0.21	1.5
2019	0.6	1.2	0	0.48	0.3	2019	3.5	5.5	1.5	0.29	1
2020	0.3	0.8	0	0.84	0.28	2020	6.9	10.6	3.3	0.31	2.1
2021	0.00	NA	NA	NA	0.00	2021	16.33	37.39	0.00	0.69	11.31

Table 3. Stratified mean catch–per-tow of horseshoe crabs in the **lower Delaware Bay** survey area in 2010-2020, with the mean, standard deviation (sd), and coefficient of variation (CV), calculated using the **delta distribution** model, by demographic group. Also included are the estimated upper and lower 95% confidence limits (UCL, LCL).

YEAR	MEAN	UCL	LCL	CV	SD	YEAR	MEAN	UCL	LCL	CV	SD
Immature Females						Immature Males					
2010	79.7	122.2	37.3	0.21	16.5	2010	61.2	105.5	16.9	0.3	18.1
2011	19.7	45.2	-5.9	0.47	9.2	2011	20.2	50.7	-10.4	0.55	11
2012	164.3	311.8	16.9	0.32	53.1	2012	192.6	548.4	-163.3	0.43	82.7
2016	196	335.5	56.6	0.29	57	2016	184.2	322.9	45.5	0.32	58.7
2017	96.7	210	-16.7	0.46	44.1	2017	62.9	137.6	-11.7	0.46	29
2018	47.2	56.2	38.1	0.08	3.8	2018	55.1	71.8	38.4	0.12	6.8
2019	9.5	24.3	-5.3	0.6	5.7	2019	5.7	15.8	-4.5	0.7	4
2020	0.3	0.8	0	0.97	0.3	2020	0.2	0.6	0	0.97	0.2
2021	3.1	NA	NA	0.99	3.1	2021	3.3	NA	NA	0.78	2.6
Mature Females						Mature Males					
2010	48.8	98.9	-1.2	0.4	19.5	2010	130.3	242.6	18.1	0.34	43.7
2011	30.3	60.4	0.2	0.36	10.8	2011	110.2	249	-28.6	0.45	50
2012	19.1	51.6	-13.4	0.4	7.6	2012	66.8	141.1	-7.4	0.35	23.3
2016	26.3	33.9	18.7	0.12	3.2	2016	161.7	192.5	131	0.08	13.3
2017	80.6	167.1	-5.8	0.39	31.1	2017	362.7	868.5	-143.2	0.5	182.2
2018	36.2	46.6	25.8	0.12	4.3	2018	94.3	117.9	70.7	0.11	10
2019	20.8	54.7	-13	0.63	13.2	2019	100.4	254	-53.2	0.59	59.7
2020	0.2	0.5	0	0.97	0.2	2020	4.1	8.8	0	0.67	2.7
2021	1.6	NA	NA	0.99	1.5	2021	8.7	NA	NA	0.72	6.3
Newly Mature Females						Newly Mature Males					
2010	9.7	25.8	-6.3	0.64	6.2	2010	4.4	9.5	-0.8	0.46	2
2011	1.4	3.8	-0.9	0.58	0.8	2011	1.4	4.9	-2.2	0.94	1.3
2012	1	4.4	-2.3	0.76	0.8	2012	6.1	14.2	-2	0.48	2.9
2016	4.6	8	1.1	0.31	1.4	2016	16.2	29	3.5	0.3	5
2017	2.1	5.9	-1.7	0.65	1.4	2017	12.4	27.6	-2.7	0.44	5.4
2018	2.3	4.4	0.2	0.35	0.8	2018	3.6	7.6	-0.5	0.44	1.6
2019	0	0	0	NA	0	2019	8	22.3	-6.4	0.7	5.6
2020	0	0	0	NA	0	2020	0.1	0.3	0	0.97	0.1
2021	0	NA	NA	NA	0	2021	0	NA	NA	NA	0

Table 4. Stratified mean catch-per-tow of horseshoe crabs in **the lower Delaware Bay** survey area in 2010-2020, with the mean, standard deviation (sd), and coefficient of variation (CV), calculated using the **normal distribution** model by demographic group. Also included are the estimated upper and lower 95% confidence limits (UCL, LCL).

YEAR	MEAN	UCL	LCL	CV	SD	YEAR	MEAN	UCL	LCL	CV	SD
Immature Females						Immature Males					
2010	79.5	116.5	42.6	0.19	15.1	2010	60.4	95.7	25.1	0.25	15.3
2011	21.3	54.2	-11.5	0.55	11.8	2011	21.5	57.2	-14.3	0.6	12.9
2012	165.5	287.6	43.4	0.3	49.9	2012	183.9	360.1	7.8	0.34	63.4
2016	186.5	284.7	88.3	0.22	40.1	2016	167.9	249.7	86	0.21	34.6
2017	90.8	176	5.6	0.37	33.2	2017	58.2	109	7.5	0.36	20.7
2018	47.1	55.6	38.6	0.08	3.6	2018	54.9	69.6	40.2	0.11	6.2
2019	16	30.4	1.5	0.35	5.6	2019	10.7	21.7	-0.4	0.4	4.3
2020	0.3	0.8	0	0.97	0.3	2020	0.2	0.6	0	0.97	0.2
2021	3.1	NA	NA	0	0	2021	3.3	NA	NA	0	0
Mature Females						Mature Males					
2010	49.1	99.8	-1.7	0.4	19.7	2010	128	227.9	28.2	0.3	38.9
2011	28.6	49.9	7.4	0.27	7.7	2011	100.3	187.7	13	0.31	31.5
2012	18.7	46.2	-8.9	0.34	6.4	2012	65.3	111.7	18.8	0.28	18.1
2016	26.2	33.4	19	0.11	3	2016	161.8	192.4	131.1	0.08	13.3
2017	80.5	165	-4	0.38	30.4	2017	303.4	531.7	75.2	0.27	82.2
2018	36.2	47.2	25.1	0.12	4.3	2018	94.7	120.3	69	0.11	10.8
2019	29.3	54.8	3.8	0.34	9.9	2019	49.9	90	9.9	0.31	15.6
2020	0.2	0.5	0	0.97	0.2	2020	4.1	8.8	0	0.67	2.7
2021	1.6	NA	NA	0	0	2021	8.7	NA	NA	0	0
Newly Mature Females						Newly Mature Males					
2010	9.6	24.9	-5.7	0.62	5.9	2010	4.3	9.1	-0.5	0.43	1.9
2011	1.4	3.8	-0.9	0.58	0.8	2011	1.4	4.9	-2.2	0.94	1.3
2012	1	4.4	-2.3	0.76	0.8	2012	6.1	14.1	-1.9	0.47	2.9
2016	4.5	8	1.1	0.3	1.3	2016	16	27.2	4.9	0.27	4.3
2017	2.1	5.9	-1.7	0.65	1.4	2017	12.4	25.7	-1	0.42	5.2
2018	2.3	4.3	0.3	0.34	0.8	2018	3.6	7.6	-0.5	0.44	1.6
2019	0	0	0	NA	0	2019	8.5	22.9	-5.9	0.66	5.6
2020	0	0	0	NA	0	2020	0.1	0.3	0	0.97	0.1
2021	0	NA	NA	NA	0	2021	0	NA	NA	NA	0

Table 5. Results of correlation analyses of mean prosomal width (mm) and survey year for mature and newly mature males and females from the Delaware Bay area and lower Delaware Bay surveys. Statistics presented are number of years included: *n*; *T*-score; probability, *p*; and correlation coefficient, *r*. A negative correlation coefficient indicates a decreasing regression slope.

Maturity Group	n	T	p	r
Delaware Bay Area				
2002 - 2021				
Mature females	17	-7.48	<0.001	-0.888
Newly mature females	17	-4.12	0.001	-0.741
Mature males	17	-14.95	<0.001	-0.968
Newly mature males	17	-4.25	<0.001	-0.739
Lower Delaware Bay				
2002 - 2021				
Mature females	9	-6.78	<0.001	-0.932
Newly mature females	9	-3.98	0.016	-0.894
Mature males	9	-6.32	<0.001	-0.922
Newly mature males	9	2.28	0.063	0.681

Table 6. Estimated population (in thousands) of horseshoe crabs in the coastal **Delaware Bay area** survey, 2002-2020, with the mean, standard deviation (sd), and coefficient of variation (CV), calculated using the **delta distribution model** by demographic group. Also included are the estimated upper and lower 95% confidence limits (UCL, LCL).

YEAR	MEAN	UCL	LCL	CV	SD	YEAR	MEAN	UCL	LCL	CV	SD
Immature Females						Immature Males					
2002	9470	15665	3275	0.31	2936	2002	5483	9284	1683	0.33	1809
2003	4585	8848	321	0.43	1972	2003	2303	4217	390	0.39	898
2004	7774	11770	3778	0.25	1944	2004	6810	10895	2725	0.29	1975
2005	5630	8856	2404	0.28	1576	2005	5260	8839	1681	0.33	1736
2006	12928	18691	7164	0.21	2715	2006	9327	14554	4100	0.24	2238
2007	13684	27486	-118	0.41	5610	2007	8966	18246	-314	0.42	3766
2008	10933	18650	3216	0.32	3499	2008	7841	13917	1766	0.35	2744
2009	39032	72868	5197	0.39	15222	2009	29864	47269	12460	0.28	8362
2010	3954	5220	2688	0.16	633	2010	2686	4144	1229	0.26	698
2011	4965	6945	2985	0.2	993	2011	3092	4547	1637	0.23	711
2016	11699	20462	2935	0.36	4212	2016	9102	16649	1555	0.39	3550
2017	7505	10708	4302	0.19	1426	2017	5091	8465	1717	0.27	1375
2018	10173	14285	6061	0.19	1933	2018	7507	11173	3842	0.23	1727
2019	3397	5516	1279	0.31	1053	2019	1487	2614	360	0.38	565
2020	9475	19779	0	0.65	6159	2020	5925	11967	0	0.61	3614
2021	4,174	7,947	400	0.53	2218	2021	2,574	4,634	513	0.47	1,199
Mature Females						Mature Males					
2002	4959	8084	1834	0.3	1488	2002	11584	17335	5834	0.24	2780
2003	3379	5160	1599	0.25	845	2003	8069	13029	3110	0.29	2340
2004	2735	4043	1426	0.23	629	2004	5150	7788	2511	0.25	1288
2005	3138	4942	1333	0.27	847	2005	5844	8461	3228	0.22	1286
2006	6611	14330	-1108	0.42	2777	2006	15825	26060	5589	0.27	4273
2007	7746	12704	2789	0.31	2401	2007	15795	25104	6487	0.28	4423
2008	6311	10202	2419	0.29	1830	2008	14647	24995	4299	0.33	4834
2009	2975	4971	979	0.32	952	2009	6240	10197	2283	0.3	1872
2010	5178	7616	2740	0.23	1191	2010	13963	21910	6015	0.28	3910
2011	5290	7282	3297	0.18	952	2011	15060	29000	1120	0.4	6024
2016	6024	8635	3413	0.21	1265	2016	21941	37216	6665	0.29	6363
2017	7185	10525	3844	0.23	1653	2017	20664	31208	10119	0.25	5166
2018	7326	10520	4131	0.21	1538	2018	15749	21880	9619	0.18	2835
2019	5110	8454	1767	0.32	1635	2019	8924	15202	2646	0.35	3108
2020	10803	15359	6247	0.25	2706	2020	31546	51050	12042	0.36	11583
2021	15,498	35,873	0	0.75	11,568	2021	38,538	85,949	0	0.7	26,925
Newly Mature Females						Newly Mature Males					
2002	1537	2400	675	0.26	400	2002	548	869	227	0.28	153
2003	794	1633	-45	0.49	389	2003	78	221	-65	0.84	66
2004	358	575	141	0.29	104	2004	789	1127	451	0.21	166
2005	479	753	206	0.27	129	2005	597	1002	191	0.33	197
2006	2051	3509	594	0.31	636	2006	3113	5113	1113	0.31	965
2007	2373	4339	408	0.4	949	2007	3129	4972	1287	0.28	876
2008	2571	4984	158	0.43	1106	2008	757	1254	261	0.31	235
2009	885	1361	410	0.26	230	2009	725	1240	210	0.34	247
2010	1338	2990	-314	0.59	789	2010	1422	3070	-226	0.55	782
2011	845	1360	331	0.3	254	2011	749	1335	164	0.36	270
2016	1608	2357	860	0.23	370	2016	2608	4884	331	0.42	1095
2017	1480	2274	687	0.26	385	2017	1523	2392	654	0.28	426
2018	1773	2923	622	0.31	550	2018	3341	5367	1316	0.29	969
2019	242	472	12	0.47	114	2019	1271	2154	389	0.34	437
2020	133	330	0	0.87	117	2020	2492	4030	953	0.37	914
2021	0	NA	NA	NA	NA	2021	6,333	14,328	0	0.68	4309

Table 7. Estimated population (in thousands) of horseshoe crabs in the coastal **Delaware Bay area** survey, 2002-2020, with the mean, standard deviation (sd), and coefficient of variation (CV), calculated using the **normal distribution** model by demographic group. Also included are the estimated upper and lower 95% confidence limits (UCL, LCL).

YEAR	MEAN	UCL	LCL	CV	SD	YEAR	MEAN	UCL	LCL	CV	SD
Immature Females						Immature Males					
2002	8222	11875	4568	0.21	1727	2002	5076	7998	2155	0.28	1421
2003	4089	6860	1317	0.32	1308	2003	2114	3462	766	0.3	634
2004	7376	10616	4135	0.21	1549	2004	6033	8786	3281	0.22	1327
2005	5104	7521	2687	0.23	1174	2005	4673	7414	1932	0.28	1308
2006	13714	20988	6439	0.25	3429	2006	9378	13971	4786	0.23	2157
2007	13692	27335	48	0.41	5614	2007	9350	19735	-1035	0.45	4208
2008	10595	16578	4612	0.26	2755	2008	6897	10443	3350	0.23	1586
2009	27375	40519	14232	0.23	6296	2009	26435	38730	14140	0.23	6080
2010	4102	5706	2497	0.19	779	2010	2781	4423	1139	0.29	806
2011	5426	8433	2420	0.27	1465	2011	3301	5219	1382	0.28	924
2016	11292	18441	4144	0.3	3388	2016	8185	13512	2858	0.31	2537
2017	7948	11818	4077	0.23	1828	2017	5082	7829	2335	0.26	1321
2018	10115	13839	6391	0.18	1821	2018	7768	11653	3882	0.24	1864
2019	14855	15027	14682	0.33	4902	2019	66	236	-104	1.27	84
2020	6832	10559	3106	0.32	2213	2020	4610	7540	1679	0.38	1740
2021	4053	7670	436	0.51	2064	2021	2548	4389	707	0.42	1074
Mature Females						Mature Males					
2002	4779	7431	2128	0.26	1243	2002	10711	14972	6450	0.19	2035
2003	3308	4851	1764	0.22	728	2003	7454	10827	4082	0.21	1565
2004	2767	3919	1615	0.2	553	2004	5586	8875	2297	0.28	1564
2005	2957	4323	1592	0.22	651	2005	5408	7322	3494	0.17	919
2006	5867	10517	1218	0.31	1819	2006	14461	21734	7188	0.23	3326
2007	6553	9864	3243	0.25	1638	2007	13100	18506	7694	0.2	2620
2008	7172	13336	1008	0.4	2869	2008	14244	23240	5247	0.3	4273
2009	3230	5523	936	0.33	1066	2009	6319	10255	2383	0.29	1833
2010	5588	8698	2478	0.26	1453	2010	14396	22600	6192	0.27	3887
2011	5388	7629	3147	0.2	1078	2011	14858	25890	3825	0.33	4903
2016	5735	7770	3700	0.17	975	2016	24017	40197	7837	0.3	7205
2017	7785	12033	3537	0.27	2102	2017	19985	29245	10724	0.23	4597
2018	9463	18463	464	0.44	4164	2018	15264	19849	10680	0.15	2290
2019	6420	6506	6334	0.32	2054	2019	11660	11824	11497	0.37	4314
2020	10927	16014	5840	0.28	3021	2020	25200	34983	15416	0.23	5810
2021	21766	40665	2867	0.49	10750	2021	61879	109880	13877	0.45	27576
Newly Mature Females						Newly Mature Males					
2002	1509	2278	741	0.24	362	2002	561	925	196	0.31	174
2003	787	1547	26	0.45	354	2003	78	222	-66	0.84	66
2004	367	613	120	0.32	117	2004	786	1120	452	0.2	157
2005	531	908	154	0.34	181	2005	580	927	233	0.29	168
2006	2122	3705	540	0.33	700	2006	3377	6076	678	0.38	1283
2007	2129	3584	674	0.33	703	2007	2841	4214	1468	0.23	653
2008	2697	4780	613	0.36	971	2008	776	1315	237	0.33	256
2009	883	1366	399	0.26	230	2009	708	1157	259	0.31	219
2010	1770	4532	-992	0.74	1310	2010	1464	3180	-252	0.56	820
2011	882	1495	269	0.34	300	2011	766	1343	190	0.36	276
2016	1583	2304	863	0.22	348	2016	2939	5588	290	0.43	1264
2017	0.00	NA	NA	NA	NA	2017	1590	2623	557	0.32	509
2018	1780	2866	695	0.29	516	2018	3064	4466	1663	0.22	674
2019	77	225	-70	0.94	73	2019	112	267	-43	0.68	77
2020	134	330	0	0.87	117	2020	2430	3676	1184	0.3	740
2021	0	NA	NA	NA	NA	2021	6308	14299	0	0.68	4307

Table 8. Estimated population (in thousands) of horseshoe crabs in the **lower Delaware Bay** survey area in 2010-2020, with the mean, standard deviation (sd), and coefficient of variation (CV), calculated using the **delta distribution** model by demographic group. Also included are the estimated upper and lower 95% confidence limits (UCL, LCL).

YEAR	MEAN	UCL	LCL	CV	SD	YEAR	MEAN	UCL	LCL	CV	SD
Immature Females						Immature Males					
2010	3510	5199	1822	0.2	702	2010	2632	4476	788	0.29	763
2011	870	1931	-191	0.44	383	2011	881	2160	-397	0.52	458
2012	8021	15084	958	0.32	2567	2012	9381	21965	-3204	0.42	3940
2016	9046	15558	2534	0.29	2623	2016	8429	14813	2044	0.32	2697
2017	4536	10029	-956	0.47	2132	2017	2920	6458	-618	0.47	1372
2018	2211	2803	1619	0.1	221	2018	2597	3516	1678	0.15	390
2019	525	1278	-229	0.56	294	2019	308	816	-201	0.64	197
2020	12	33	0	0.97	12	2020	8	22	0	0.97	8
2021	130	NA	NA	0.99	129	2021	140	NA	NA	0.78	109
Mature Females						Mature Males					
2010	2117	4260	-25	0.39	826	2010	5657	10247	1067	0.32	1810
2011	1348	2599	96	0.33	445	2011	4829	10570	-912	0.43	2076
2012	938	2522	-646	0.39	366	2012	3263	6864	-338	0.35	1142
2016	1274	1710	837	0.15	191	2016	7735	9709	5761	0.1	774
2017	3674	7501	-153	0.38	1396	2017	16794	40517	-6929	0.51	8565
2018	1771	2588	953	0.18	319	2018	4616	6600	2631	0.18	831
2019	1148	3011	-715	0.63	723	2019	5746	14583	-3092	0.6	3448
2020	7	19	0	0.97	7	2020	152	332	0	0.68	103
2021	65	NA	NA	0.99	64	2021	365	NA	NA	0.72	262
Newly Mature Females						Newly Mature Males					
2010	414	1087	-260	0.63	261	2010	187	409	-35	0.46	86
2011	65	170	-40	0.58	38	2011	58	208	-93	0.94	55
2012	50	214	-114	0.76	38	2012	301	710	-109	0.49	147
2016	206	357	55	0.3	62	2016	727	1268	186	0.29	211
2017	88	249	-73	0.66	58	2017	542	1100	-16	0.4	217
2018	115	220	9	0.36	41	2018	148	290	7	0.4	59
2019	0	0	0	NA	0	2019	361	1022	-299	0.71	257
2020	0	0	0	NA	0	2020	4	11	0	0.97	4
2021	0	NA	NA	NA	NA	2021	0	NA	NA	NA	NA

Table 9. Estimated population (in thousands) of horseshoe crabs in the **lower Delaware Bay** survey area in 2010-2019, with the mean, standard deviation (sd), and coefficient of variation (CV), calculated using the **normal distribution** model by demographic group. Also included are the estimated upper and lower 95% confidence limits (UCL, LCL).

YEAR	MEAN	UCL	LCL	CV	SD	YEAR	MEAN	UCL	LCL	CV	SD
Immature Females						Immature Males					
2010	3503	5155	1851	0.18	631	2010	2588	4056	1120	0.24	621
2011	938	2311	-435	0.53	497	2011	935	2437	-567	0.58	542
2012	8125	14222	2027	0.31	2519	2012	9023	17690	356	0.35	3158
2016	8618	13190	4046	0.22	1896	2016	7725	11638	3812	0.21	1622
2017	4325	8829	-178	0.41	1773	2017	2731	5408	53	0.38	1038
2018	2209	2780	1638	0.1	221	2018	2595	3529	1661	0.15	389
2019	852	868	836	0.01	9	2019	566	566	566	0	0
2020	12	33	0	0.97	12	2020	8	22	0	0.97	8
2021	130	NA	NA	0	0	2021	140	NA	NA	0	0
Mature Females						Mature Males					
2010	2124	4340	-91	0.41	871	2010	5600	9916	1285	0.3	1680
2011	1290	2239	340	0.27	348	2011	4479	8332	625	0.31	1388
2012	915	2242	-412	0.34	311	2012	3188	5456	921	0.28	893
2016	1264	1647	880	0.13	164	2016	7727	9570	5883	0.1	773
2017	3654	7307	2	0.36	1315	2017	13805	23702	3908	0.26	3589
2018	1782	2666	898	0.19	339	2018	4647	6901	2393	0.19	883
2019	1932	1948	1916	0	0	2019	8356	8356	8356	0	0
2020	7	19	0	0.97	7	2020	152	332	0	0.68	103
2021	65	NA	NA	0	0	2021	365	NA	NA	0	0
Newly Mature Females						Newly Mature Males					
2010	418	1097	-260	0.63	263	2010	185	391	-22	0.43	80
2011	65	170	-40	0.58	38	2011	58	208	-93	0.94	55
2012	50	214	-114	0.76	38	2012	302	719	-114	0.5	151
2016	205	355	55	0.28	57	2016	716	1176	256	0.25	179
2017	88	249	-73	0.66	58	2017	541	1090	-9	0.4	216
2018	114	226	3	0.35	40	2018	149	296	1	0.41	61
2019	0	0	0	NA	0	2019	401	408	394	0	3
2020	0	0	0	NA	0	2020	4	11	0	0.97	4
2021	0	NA	NA	NA	NA	2021	0	NA	NA	NA	NA

Table 10. Mean, minimum (min), and maximum (max) bottom water temperature (C°) and ordinal sampling date (numerical calendar date from 1 January) for survey collections in the Delaware Bay area and Lower Delaware Bay. For reference, 1 September is ordinal date 243 in non-leap years.

	<u>Water Temperature</u>			<u>Ordinal Date</u>		
	mean	max	min	mean	max	min
Delaware Bay Area						
2002	19.33	15	23.5	277.41	273	300
2003	17.41	13.5	20	286.60	278	296
2004	16.67	14.5	20.5	292.74	277	302
2005	20.94	14	24.5	261.23	250	306
2006	17.53	13	22.3	284.53	246	314
2007	19.69	14.3	23.3	294.96	282	311
2008	20.09	19.3	22.6	277.02	272	287
2009	15.54	14.3	17	315.24	307	324
2010	19.72	12.3	24.1	282.68	265	331
2011	21.60	18.6	23.8	265.44	254	296
2012	18.47	18.1	18.8	292.92	289	298
2016	22.82	18.6	24.8	274.02	260	299
2017	21.89	18.8	23.2	274.05	263	294
2018	22.48	13.9	24.8	276.41	253	315
2019	23.05	18.8	24.3	250.38	242	270
2020	21.79	17	25	231.15	219	252
2021	23.25	18.8	28	233.44	222	250
Lower Delaware Bay						
2010	17.18	16.7	17.7	295.36	295	296
2011	18.32	18	18.6	294.27	294	295
2012	17.96	17.9	18	299.00	299	299
2016	19.56	19	20.1	288.40	288	289
2017	19.35	19.2	19.5	292.30	292	293
2018	12.16	11.3	12.8	321.44	321	322
2019	17.50	17.2	17.8	292.00	292	292
2020	24.00	23.2	25.4	248.00	248	248
2021	20.50	19	22	268.00	268	268

Table 11. Correlations between annual mean catches-per-tow of horseshoe crabs with mean bottom water temperature and ordinal sampling date in the Delaware Bay area survey and the lower Delaware Bay survey, by demographic group. The Delaware Bay area surveys included 15 years, and the lower Delaware Bay surveys included 8 years. Statistics presented include correlation coefficient, r ; T -score; and probability, p . Data are from Tables 1, 3, and 10.

	Water Temperature			Ordinal Date		
	r	T	p	r	T	p
Delaware Bay Area						
Immature females	-0.536	-2.38	0.032	0.567	2.58	0.022
Immature males	-0.547	-2.44	0.028	0.585	2.7	0.017
Mature females	0.562	2.55	0.023	-0.71	-3.78	0.002
Mature males	0.576	2.63	0.02	-0.711	-3.78	0.002
Newly mature females	-0.142	-0.54	0.6	0.51	2.22	0.044
Newly mature males	0.47	1.99	0.066	-0.498	-2.15	0.049
Lower Delaware Bay						
Immature females	-0.116	-0.31	0.767	0.346	0.98	0.362
Immature males	-0.154	-0.41	0.692	0.36	1.02	0.341
Mature females	-0.371	-1.06	0.325	0.537	1.69	0.136
Mature males	-0.153	-0.41	0.694	0.37	1.05	0.327
Newly mature females	-0.273	-0.75	0.477	0.318	0.89	0.405
Newly mature males	-0.086	-0.23	0.826	0.303	0.84	0.428

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Red Knot Stopover Population Size and Migration Ecology at Delaware Bay, USA, 2022

A report submitted to the Adaptive Resource Management Subcommittee and Delaware Bay Ecosystem Technical Committee of the Atlantic States Marine Fisheries Commission

7 September 2022

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Abstract. Red Knots (*Calidris canutus rufa*) stop at Delaware Bay during northward migration to feed on eggs of horseshoe crabs (*Limulus polyphemus*). In the late 1990s and early 2000s, the number of Red Knots found at Delaware Bay declined from ~50,000 to ~13,000. Horseshoe crabs have been harvested for use as bait in eel and whelk fisheries since at least 1990, and some avian conservation biologists hypothesized that crab harvest levels in the 1990s prevented sufficient refueling for successful migration to the breeding grounds, nesting, and survival for the remainder of the annual cycle. Since 2013, the harvest of horseshoe crabs in the Delaware Bay region has been managed using an Adaptive Resource Management (ARM) framework. The objective of the ARM framework is to manage sustainable harvest of Delaware Bay horseshoe crabs while maintaining ecosystem integrity and supporting Red Knot recovery with adequate stopover habitat for Red Knots and other migrating shorebirds. For annual harvest recommendations, the ARM framework requires annual estimates of horseshoe crab population size and the Red Knot stopover population. We conducted a mark-recapture-resight investigation to estimate the passage population of Red Knots at Delaware Bay in 2022. We used a Bayesian analysis of a Jolly-Seber model, which accounts for turnover in the population and the probability of detection during surveys. The 2022 Red Knot mark-resight dataset included a total of 1,546 individual birds that were recorded at least one during mark-resight surveys at Delaware Bay in 2022. The passage population size in 2022 was estimated at 39,800 (95% credible interval: 35,013 – 55,355). Although there is broad overlap in the confidence intervals for population estimate from 2020–2022, the population estimate for 2022 was below 40,000 birds for the first time since 2011. The 2022 population size estimate will inform decision making for harvest recommendations in the next management cycle.

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2 Background

Red Knots (*Calidris canutus rufa*) stop at Delaware Bay during northward migration to feed on eggs of horseshoe crabs (*Limulus polyphemus*). The northward migration of *C. c. rufa* coincides with the spawning of horseshoe crabs, whose eggs are the perfect food for a migrating Red Knots because they are easily digestible and energy-rich (Karpanty et al. 2006, Haramis et al. 2007). Horseshoe crabs are therefore an important food resource for Red Knots as well as other shorebirds at Delaware Bay.

Horseshoe crabs have been harvested since at least 1990 for use as bait in American eel (*Anguilla rostrata*) and whelk (*Busycon*) fisheries (Kreamer and Michels 2009). In the late 1990s and early 2000s the number of Red Knots found at Delaware Bay declined from ~50,000 to ~13,000 (Niles et al. 2008). At the same time the number of horseshoe crabs harvested also declined and avian conservation biologists hypothesized that unregulated harvest of horseshoe crabs from Delaware Bay in the 1990s prevented sufficient refueling during stopover for successful migration to the breeding grounds, nesting, and survival for the remainder of the annual cycle (McGowan et al. 2011).

The harvest of horseshoe crabs in the Delaware Bay region has been managed by the Atlantic States Marine Fisheries Commission (ASMFC) since 2012 using an Adaptive Resource Management (ARM) framework (McGowan et al. 2015b). The ARM framework was designed to constrain the harvest so that number of spawning crabs would not limit the number of Red Knots stopping at Delaware Bay during migration. This management framework to achieve multiple objectives requires an estimate each year of both the crab population and the Red Knot stopover population size to inform harvest recommendations (McGowan et al. 2015a). Therefore, we estimated the stopover population size in 2022 using mark-resight data on individually-marked birds and a Jolly-Seber model for open populations, as we have each year since 2011.

3 Methods

Red knots have been individually marked at Delaware Bay and other locations in the Western Hemisphere with engraved leg flags since 2003. Each leg flag is engraved with a field-readable, unique 3-character alphanumeric code (Clark et al. 2005). Mark-resight data (i.e., sight records of individually-marked birds and counts of marked and unmarked birds) were collected on the Delaware and New Jersey shores of Delaware Bay in 2022 according to the methods for mark-resight investigations of Red Knots at Delaware Bay (Lyons 2016). This protocol has been used at Delaware Bay since 2011.

Surveys to locate leg-flagged birds were conducted on each beach in 2022, every three days in May and June according to the sampling plan (Table 1). During these resighting surveys, agency staff and volunteers surveyed the entire beach and recorded as many alphanumeric combinations as possible.

As in previous years, all flag resightings were validated with physical capture and banding data available in the data repository at <http://www.bandedbirds.org/>. Resightings without a corresponding record of physical capture and banding (i.e., “misread” errors) were discarded and not included in the analysis. However, banding data from Argentina are not available for validation purposes in [bandedbirds.org](http://www.bandedbirds.org/); therefore, all resightings of orange engraved flags were included in the analysis without validation using banding data. We also omitted resightings of 12 flagged individuals in 2022 whose flag codes were previously accidentally deployed in both New Jersey and South Carolina (Amanda Dey, New Jersey Division of Fish and Wildlife, pers. comm., 31 May 2017) because it is not possible to confirm individual identity in this case. Section 4 “Summary of Mark-resight and Count Data Collected in 2022” describes additional quality control procedures and the potential for other types of errors in the mark-resight dataset.

While searching for birds marked with engraved leg flags, observers also periodically used a scan sampling technique to count marked and unmarked birds in randomly selected portions of Red Knot flocks (Lyons 2016).

To estimate stopover population size, we used the methods of Lyons et al. (2016) to analyze 1) the mark-resight data (flag codes), and 2) data from the scan samples of the marked:unmarked

ratio. Lyons et al. (2016) rely on the “superpopulation” approach developed by Crosbie and Manly (1985) and Schwarz and Arnason (1996). The superpopulation is defined as the total number of birds present in the study area on at least one of the sampling occasions over the entire study, i.e., the total number of birds present in the study area at any time between the first and last sampling occasions (Nichols and Kaiser 1999). In this superpopulation approach, passage population size is estimated each year using the Jolly-Seber model for open populations, which accounts for the flow-through nature of migration areas and probability of detection during surveys.

In our analyses for Delaware Bay, the days of the migration season were aggregated into 3-day sampling periods (a total of 10 sample periods possible each season, Table 1). Data were aggregated to 3-day periods because this is the amount of time necessary to complete mark-resight surveys on all beaches in the study (a summary of the mark-resight data from 2022 is provided in Appendix 1).

With the mark-resight superpopulation approach, we first estimated the number of birds that were carrying leg flags, and then adjusted this number to account for unmarked birds using the estimated proportion of the population with flags. The estimated proportion with leg flags is thus an important statistic. We used the scan sample data (i.e., the counts of marked birds and the number checked for marks) and a binomial model to estimate the proportion of the population that is marked. To account for the random nature of arrival of marked birds in the bay and the addition of new marks during the season, we implemented the binomial model as a generalized linear mixed model with a random effect for the sampling period. More detailed methods are provided in Lyons et al. (2016) and Appendix 2.

4 Summary of Mark-resight and Count Data Collected in 2022

Mark-resight encounter data.—The 2022 Red Knot mark-resight dataset included a total of 1,546 individual birds that were recorded at least one during mark-resight surveys at Delaware Bay in 2022; these birds were originally captured and banded with leg flags in five different countries (Table 2). This total is remarkably close to the total detected at Delaware Bay in 2020 and 2021: 1,587 and 1,591 individual birds were recorded in 2020 and 2021, respectively (Table

2). Approximately the same number of flagged Red Knots were detected at Delaware Bay in 2020, 2021, and 2022 (Table 2).

There was sufficient data for analysis in 9 of the 10 sampling periods in 2022 (≤ 10 May to 3 June; Table 1). In 2022, data beyond 3 June were too sparse for analysis and were not included.

While the number of birds detected in 2022 was similar to the number detected in 2020 and 2021, this number of individuals resighted within a season is lower than recent (pre-COVID-19) years given the limited use of volunteers for safety reasons. The number of marked birds detected and available for analysis in 2022 was approximately 50% of the number available for analysis in the 2019 ($n = 3,072$ birds) and 40% of the number available for analysis in 2018 ($n = 3,820$).

One assumption of the mark-resight approach is that individual identity of marked birds is recorded without error (see Lyons 2016 for discussion of all model assumptions). As noted above, some field-recording errors are evident when sight records are compared to physical capture records available from bandedbirds.org. Again, any engraved flag reported by observers that did not have a corresponding record of physical capture was omitted. Field observers submitted 5,195 resightings in 2022; 80 were not valid (i.e., no corresponding banding data), for an overall misread of 1.5%. These invalid resightings were removed before analysis, but a second type of “false positive” is still possible, i.e., false positive detection of flags that were deployed prior to 2022 but were not in fact present at Delaware Bay in 2022. It is not possible to identify this second type of false positive with banding data validation or other quality assurance/quality control methods.

Marked-ratio data.—In 2022, 541 marked ratio scan samples were collected: 330 and 211 samples in Delaware and New Jersey, respectively (Appendix 3). In 2020 and 2021, respectively, 734 and 564 marked-ratio scan samples were collected.

Aerial and ground count data.—Aerial surveys were conducted on 22 and 26 May 2022 (Table 3; data provided by S. Feigin, Wildlife Restoration Partnerships on behalf of New Jersey DEP Fish

and Wildlife). Ground and boat surveys were also conducted in Delaware and New Jersey on 22 and 26 May 2022 (Table 3).

5 Summary of 2022 Migration

The pattern of arrivals at Delaware Bay in 2022 shows one large peak of arrivals about 18 May, with approximately 25% of all birds that stopped in the bay in 2022 arriving between 17 and 19 May (Fig. 1a). The numbers of birds arriving in the preceding (15 May) and following (21 May) 3-day periods were also relatively large (approximately 20% of all arrivals in each). In 2022, few birds arrived before 14 May or after 28 May.

Stopover persistence is the probability that a bird present at Delaware Bay during sampling period i is present at sampling period $i + 1$. In 2022, stopover persistence started off relatively high (Fig 1b). Stopover persistence declined around 18 May and again around 21 May, indicating some early departures and turnover in the population. A second peak in stopover persistence around 24 May indicated few departures in this sampling period. After 24 May, persistence declined sharply, indicating synchronous departures of the remaining birds between 27 and 30 May.

Following Lyons et al. (2016), we used the Jolly-Seber model to estimate stopover duration. Stopover duration declined slightly in 2022 for the third year in a row. In 2022, estimated average stopover duration was 9.4 days (95% credible interval 8.6–10.9 days). The stopover duration estimate (and 95% credible interval) was 12.1 days in 2019 (11.6 – 12.5), 10.7 days in 2020 (9.9 – 11.7), and 10.3 days in 2021 (9.0-12.1). This method of estimating stopover duration provides a coarse measure in our Delaware Bay study, however, because it is derived from the estimated number of sampling periods that birds remained in the study area. Sampling periods in this analysis are 3 consecutive days in which the data are aggregated (Table 1). To estimate stopover duration in days at Delaware Bay with this method, we first estimate the number of sampling periods that each bird remained in the study area and then multiply this by 3 (the number of days in each period). The resolution of the stopover duration estimate is thus limited by the resolution of the sampling periods (i.e., the time step in the mark-recapture model).

Probability of resighting in 2022 was relatively low early in the season, less than 20% in four of the first five sampling periods (10 – 21 May, Fig 1c). Probability of resighting increased steadily after 21 May until the end of the season, when it peaked at approximately 50%.

In 2022, 8.4% of the stopover population carried engraved leg flags (95% CI: 7.4% –9.7%). This is similar to the 2021 estimate (8.2% with leg flags [95% CI: 7.0%–9.1%]) and slightly lower than the 2020 estimate (9.6% with leg flags [95% CI: 8.8%–10.3%]).

6 Stopover Population Estimation

The passage population size in 2022 was estimated at 39,800 (95% credible interval: 35,013 – 51,355). Unlike the aerial survey, this superpopulation estimate accounts for turnover in the population and probability of detection. The 2022 stopover population estimate is slightly lower than the 2021 estimate and is below 40,000 for the first time since 2011 when this mark-resight analysis began (Table 4). However, there was wide overlap of the confidence intervals for the stopover population estimates in recent years (Table 4).

Like 2020–2021 population estimates, the 2022 estimate is slightly lower than the 2018 and 2019 estimates (Table 4) and the confidence interval is wider. The uncertainty in the population estimate and wide confidence intervals are due in part to the low probability of resighting for many of the sampling periods during 2020-2022 compared to earlier years (early 2021 notwithstanding).

The time-specific stopover population estimates in 2022 increased steadily from the beginning of the season and peaked around 18–21 May (approximately 20,700 birds; Fig. 1d). Time-specific estimates declined to approximately 13,500 for 24 – 27 May and then declined steadily until 2 June (Fig. 1d).

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Table 1. Dates for mark-resight survey periods (3-day sampling occasions) at Delaware Bay. Survey period 10 was not used in 2022 because the mark-resight data were sparse in this period.

Survey period	Dates	Survey period	Dates
1	≤10 May	6	23-25 May
2	11-13 May	7	26-28 May
3	14-16 May	8	29-31 May
4	17-19 May	9	1-3 June
5	20-22 May	10	4-6 June

Table 2. Number of Red Knot (*C. c. rufa*) flags detected in Delaware Bay from 2019–2022 by banding location (flag color).

Banding location (flag color)	No. flagged individuals detected			
	2019	2020	2021	2022
U.S. (lime green)	2,368	1,255	1,292	1,281
U.S. (dark green)	351	161	118	118
Argentina (orange)	216	89	81	66
Canada (white)	156	52	78	62
Brazil (dark blue)	35	21	17	14
Chile (red)	10	9	5	5
Total	3,136	1,587	1,591	1,546

Table 3. Number of Red Knots detected during aerial and ground surveys of Delaware Bay in 2022. Data provided by S. Feigin, Wildlife Restoration Partnerships on behalf of the New Jersey DEP Fish and Wildlife, Endangered and Nongame Species Program.

	Delaware	New Jersey	Total
Aerial/Ground Surveys			
22 May 2022	280	11,834	12,114
26 May 2022	1,054*	8,660	9,714
Ground/Boat Surveys			
22 May 2022	132	10,812	10,944
26 May 2022	1,054	8,996	10,050

* Delaware ground survey total from 26 May 2022 (1,054 birds) was used here rather than the aerial count of the Delaware shore on the same day because the aerial count (875 birds) was lower than the corresponding ground count.

Table 4. Red Knot stopover (passage) population estimate using mark-resight methods compared to peak-count index using aerial- or ground-survey methods at Delaware Bay. The mark-resight estimate, N^* , of stopover (passage) population accounts for population turnover during migration; peak-count index, a single count on a single day, does not account for turnover. “AG” indicates a combination of aerial and ground counts used to formulate the peak-count index.

Year	Stopover population ^a (mark-resight N^*)	95% CI Stopover pop- ulation N^*	Peak-count index [aerial (A); ground (G)]
2011	43,570	(40,880 – 46,570)	12,804 (A) ^b
2012	44,100	(41,860 – 46,790)	25,458 (G) ^c
2013	48,955	(39,119 – 63,130)	25,596 (A) ^d
2014	44,010	(41,900 – 46,310)	24,980 (A) ^c
2015	60,727	(55,568 – 68,732)	24,890 (A) ^c
2016	47,254	(44,873 – 50,574)	21,128 (A) ^b
2017	49,405 ^e	(46,368 – 53,109)	17,969 (A) ^f
2018	45,221	(42,568 – 49,508)	32,930 (A) ^b
2019	45,133	(42,269 – 48,393)	30,880 (A) ^g
2020	40,444	(33,627 – 49,966)	19,397 (G) ^c
2021	42,271	(35,948 – 55,210)	6,880 (AG) ^h
2022	39,800	(35,013 – 51,355)	12,114 (AG) ^g

^a passage population estimate for entire season, including population turnover

^b 23 May

^c 24 May

^d 28 May

^e Data management procedures to reduce bias from recording errors in the field; data from observers with greater than average misread rate were not included in the analysis.

^f 26 May

^g 22 May

^h 27 May

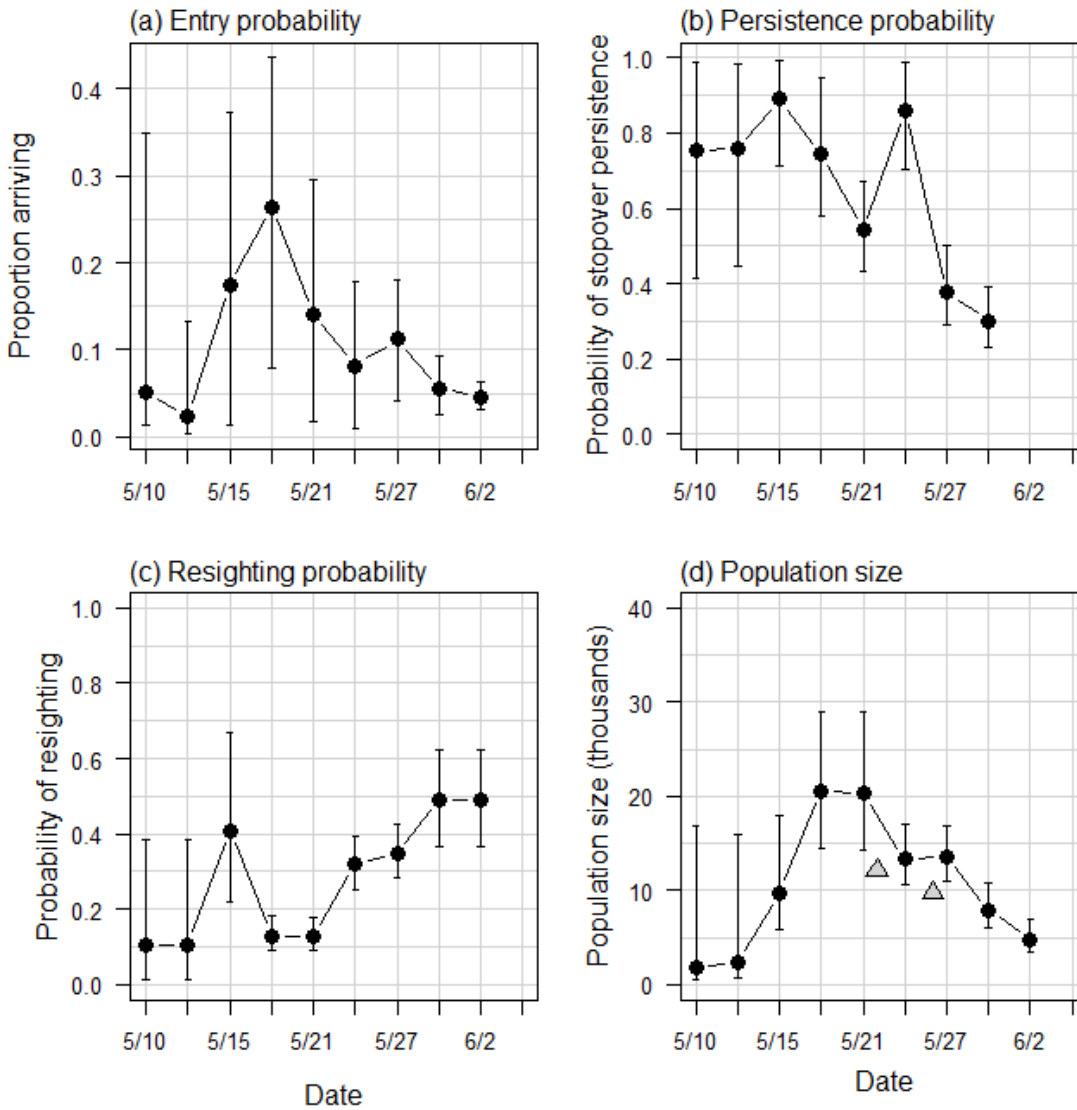


Figure 1. Estimated Jolly-Seber (JS) model parameters from a mark-resight study of Red Knots at Delaware Bay in 2022: (a) proportion of stopover population arriving at Delaware Bay, (b) stopover persistence, (c) probability of resighting, and (d) time-specific stopover population size. Dates on the x-axis represent sampling occasions (3-day survey periods, Table 1). Triangles in (d) are total counts conducted on 22 May 2022 (sum of aerial counts for both DE and NJ) and 26 May 2022 (sum of ground count of DE and aerial count of NJ).

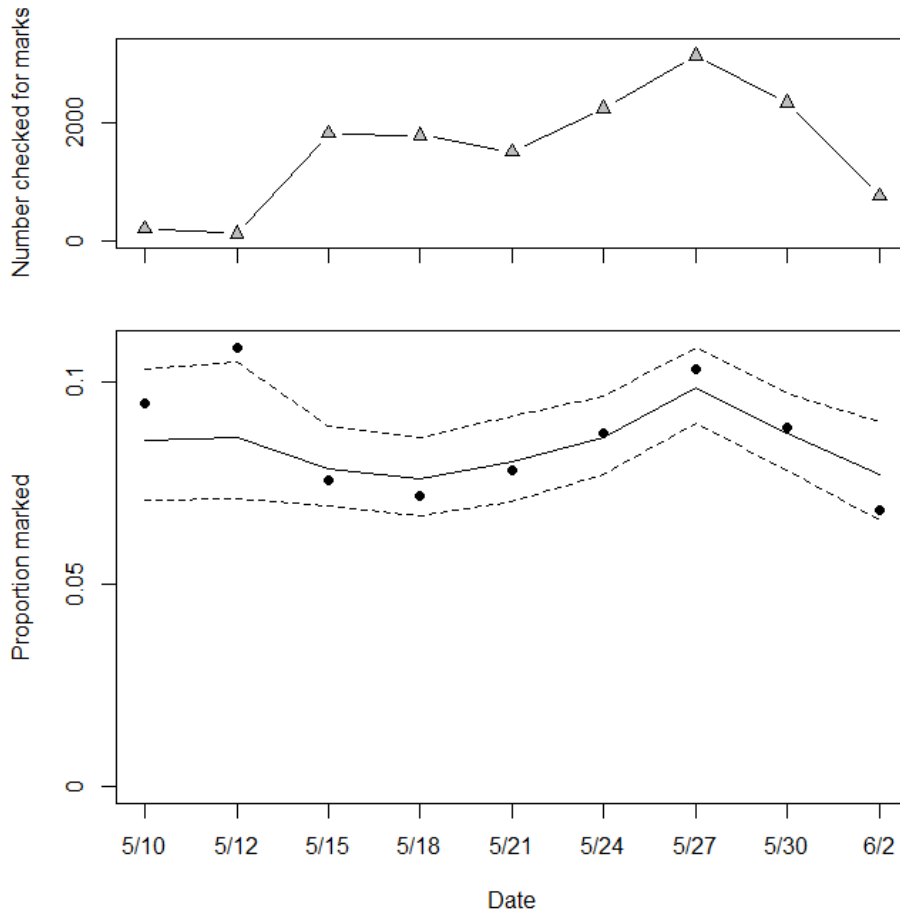


Figure 2. Estimated proportion of the Delaware Bay stopover population carrying leg flags in 2022 (overall average and 95% credible interval: 0.084 [0.073, 0.095]). The marked proportion was estimated from marked-ratio scan samples for each 3-day sampling period. The dates for the sampling periods are shown in Table 1. The upper panel shows the sample size (number scanned, i.e., checked for marks) for each sample period. The bottom panel shows the estimated proportion marked at each sample occasion, which was estimated with the generalized linear mixed model described in Appendix 2. Solid and dashed lines are estimated median proportion marked and 95% credible interval, respectively; filled circles show (number with marks/number scanned).

Appendix 1. Summary of 2022 mark-resight data (“m-array”). NR = never resighted.

Sample	Dates	Resighted	Next resighted at sample								NR
			2	3	4	5	6	7	8	9	
1	≤10 May	17	3	3	0	2	0	0	0	0	9
2	11-13 May	22		8	1	0	1	0	1	0	11
3	14-16 May	309			37	19	25	22	6	1	199
4	17-19 May	199				23	22	10	5	1	138
5	20-22 May	206					39	13	13	3	138
6	23-25 May	366						118	34	1	213
7	26-28 May	465							85	14	366
8	29-31 May	339								51	288
9	1-3 June	174									

Appendix 2. Statistical Methods to Estimate Stopover Population Size Using Mark-Resight Data and Counts of Marked Birds

We converted the observations of marked birds into encounter histories, one for each bird, and analyzed the encounter histories with a Jolly-Seber (JS) model (Jolly 1965, Seber 1965, Crosbie and Manly 1985, Schwarz and Arnason 1996). The JS model includes parameters for recruitment (β), survival (ϕ), and capture (p) probabilities; in the context of a mark-resight study at a migration stopover site, these parameters are interpreted as probability of arrival to the study area, stopover persistence, and resighting, respectively. Stopover persistence is defined as the probability that a bird present at time t remains at the study area until time $t + 1$. The Crosbie and Manley (1985) and Schwarz and Arnason (1996) formulation of the JS model also includes a parameter for superpopulation size, which in our approach to mark-resight inferences for stopover populations is an estimate of the marked (leg-flagged) population size.

We chose to use 3-day periods rather than days as the sampling interval for the JS model given logistical constraints on complete sampling of the study area; multiple observations of the same individual in a given 3-day period were combined for analysis. A summary (m-array) of the mark-resight data is presented in Appendix 1.

We made inference from a fully-time dependent model; arrival, persistence, and resight probabilities were allowed to vary with sampling period [$\beta_t \phi_t p_t$]. In this model, we set $p_1 = p_2$ and $p_{k-1} = p_k$ (where K is the number of samples) because not all parameters are estimable in the fully-time dependent model (Jolly 1965, Seber 1965, Crosbie and Manly 1985, Schwarz and Arnason 1996).

We followed the methods of Royle and Dorazio (2008) and Kéry and Schaub (2012, Chapter 10) to fit the JS model using the restricted occupancy formulation. Royle and Dorazio (2008) use a state-space formulation of the JS model with parameter-expanded data augmentation. For parameter-expanded data augmentation, we augmented the observed encounter histories with all-zero encounter histories ($n = 2000$) representing potential recruits that were not detected (Royle and Dorazio 2012). We followed Lyons et al. (2016) to combine the JS model with a binomial model for the counts of marked and unmarked birds in an integrated Bayesian analysis. Briefly, the counts of marked birds (m_s) in the scan samples are modeled as a binomial random variable:

$$m_s \sim \text{Bin}(C_s, \pi), \quad (1)$$

where m_s is the number of marked birds in scan sample s , C_s is the number of birds checked for marks in scan sample s , and π is the proportion of the population that is marked. Total stopover population size \widehat{N}^* is estimated by

$$\widehat{N}^* = \widehat{M}^* / \widehat{\pi} \quad (2)$$

where \widehat{M}^* is the estimate of marked birds from the J-S model and $\widehat{\pi}$ is the proportion of the population that is marked (from Eq. 1). Estimates of marked subpopulation sizes at each resighting occasion t (\widehat{M}_t^*) are available as derived parameters in the analysis. We calculated an estimate of population size at each mark-resight sampling occasion \widehat{N}_t^* using \widehat{M}_t^* and $\widehat{\pi}$ as in equation 2.

To better account for the random nature of the arrival of marked birds and addition of new marks during the season, we used a time-specific model for proportion with marks in place of equation 1 above:

$$m_{s,t} \sim \text{Binomial}(C_{s,t}, \pi_t) \quad (3)$$

for s in $1, \dots, n_{\text{samples}}$ and t in $1, \dots, n_{\text{occasions}}$

$$\text{logit}(\pi_t) = \alpha + \delta_t$$

$$\delta_t \sim \text{Normal}(0, \sigma_{\text{occasions}}^2)$$

where m_s is the number of marked birds in scan sample s , C_s is the number of birds checked for marks in scan sample s , δ_t is a random effect time of sample s , and π_t is the time-specific proportion of the population that is marked. Total stopover population size \widehat{N}^* was estimated by summing time-specific arrivals of marked birds to the stopover (B_t) and expanding to include unmarked birds using estimates of proportion marked:

$$\widehat{N}^* = \sum \widehat{B}_t / \pi_t$$

Time-specific arrivals of marked birds are estimated from the Jolly-Seber model using $\widehat{B}_t = \widehat{\beta}_t \widehat{M}^*$ where \widehat{M}^* is the estimate of the number of marked birds and $\widehat{\beta}_t$ is the fraction of the population arriving at time t .

Appendix 3. Number of marked-ratio scan samples.

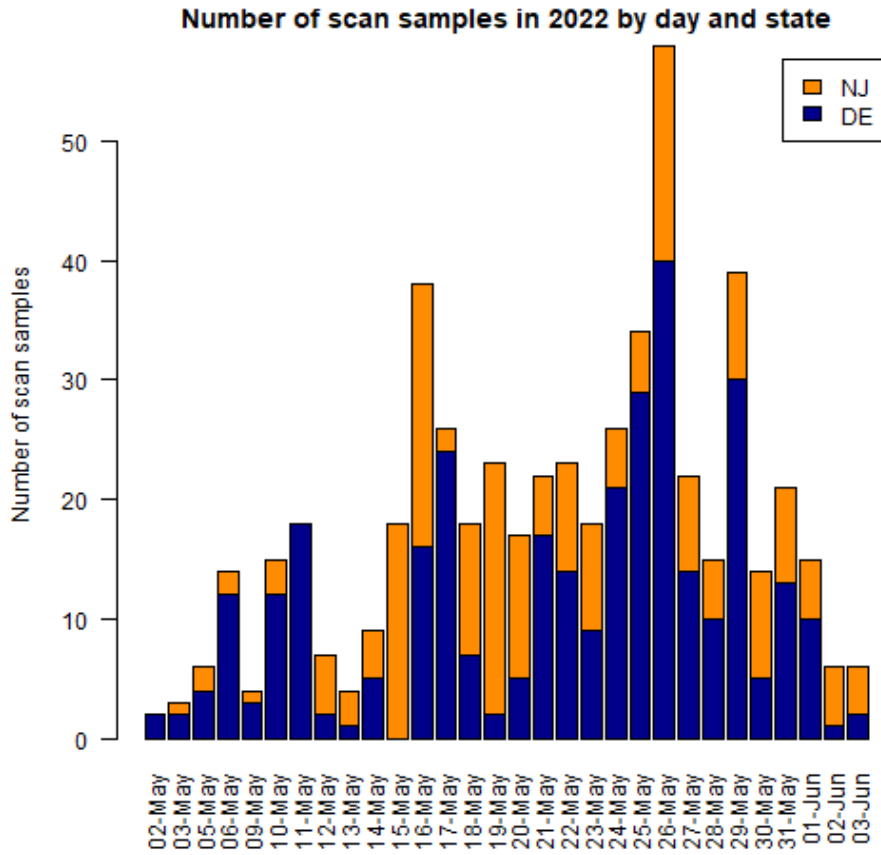
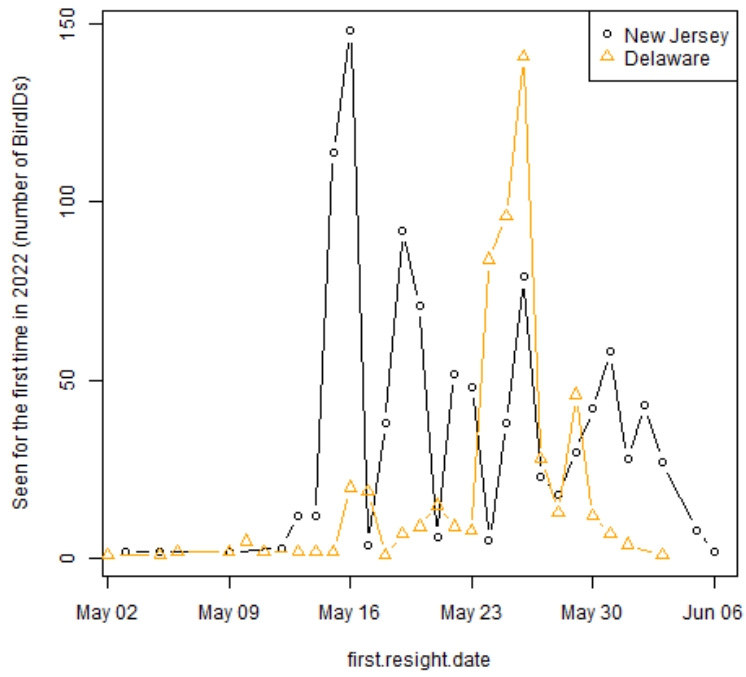


Figure A3.1. Number of marked-ratio scan samples (n = 541) collected in Delaware Bay in 2022 by field crews in Delaware (blue, n = 330 scan samples) and New Jersey (orange, n = 211 scan samples) and date.



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ATLANTIC STATES MARINE FISHERIES COMMISSION

REVIEW OF THE INTERSTATE FISHERY MANAGEMENT PLAN

HORSESHOE CRAB
(Limulus polyphemus)

2021 Fishing Year



Prepared by the Plan Review Team

October 2022



Sustainable and Cooperative Management of Atlantic Coastal Fisheries

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I. Status of the Fishery Management Plan

<u>Date of FMP Approval:</u>	December 1998
<u>Amendments</u>	None
<u>Addenda</u>	Addendum I (April 2000) Addendum II (May 2001) Addendum III (May 2004) Addendum IV (June 2006) Addendum V (September 2008) Addendum VI (August 2010) Addendum VII (February 2012)
<u>Management Unit:</u>	Entire coastwide distribution of the resource from the estuaries eastward to the inshore boundary of the EEZ
<u>States with Declared Interest:</u>	Massachusetts – Florida, Potomac River Fisheries Commission
<u>Active Boards/Committees:</u>	Horseshoe Crab Management Board, Advisory Panel, Technical Committee, and Plan Review Team; Delaware Bay Ecosystem Technical Committee; Adaptive Resource Management Subcommittee

Goals and Objectives

The Interstate Fishery Management Plan for Horseshoe Crabs (FMP) established the following goals and objectives.

2.0. Goals and Objectives

The goal of this Plan is to conserve and protect the horseshoe crab resource to maintain sustainable levels of spawning stock biomass to ensure its continued role in the ecology of the coastal ecosystem, while providing for continued use over time. Specifically, the goal includes management of horseshoe crab populations for continued use by:

- 1) current and future generations of the fishing and non-fishing public (including the biomedical industry, scientific and educational research);*
- 2) migrating shorebirds; and,*
- 3) other dependent fish and wildlife, including federally listed (threatened) sea turtles.*

To achieve this goal, the following objectives must be met:

- (a) prevent overfishing and establish a sustainable population;*
- (b) achieve compatible and equitable management measures among jurisdictions throughout the fishery management unit;*

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- (c) establish the appropriate target mortality rates that prevent overfishing and maintain adequate spawning stocks to supply the needs of migratory shorebirds;*
- (d) coordinate and promote cooperative interstate research, monitoring, and law enforcement;*
- (e) identify and protect, to the extent practicable, critical habitats and environmental factors that limit long-term productivity of horseshoe crabs;*
- (f) adopt and promote standards of environmental quality necessary for the long-term maintenance and productivity of horseshoe crabs throughout their range; and,*
- (g) establish standards and procedures for implementing the Plan and criteria for determining compliance with Plan provisions.*

Fishery Management Plan Summary

The framework for managing horseshoe crabs along the Atlantic coast was approved in October 1998 with the adoption of the Interstate Fishery Management Plan (FMP) for Horseshoe Crabs. The goal of this plan is to conserve and protect the horseshoe crab resource to maintain sustainable levels of spawning stock biomass to ensure its continued role in the ecology of coastal ecosystems while providing for continued use over time.

In 2000, the Horseshoe Crab Management Board approved Addendum I to the FMP. Addendum I established a state-by-state cap on horseshoe crab bait landings at 25 percent below the reference period landings (RPL's), and *de minimis* criteria for those states with a limited horseshoe crab fishery. Those states with more restrictive harvest levels (Maryland and New Jersey) were encouraged to maintain those restrictions to provide further protection to the Delaware Bay horseshoe crab population, recognizing its importance to migratory shorebirds. Addendum I also recommended that the National Marine Fisheries Service (NMFS) prohibit the harvest of horseshoe crabs in federal waters (3-200 miles offshore) within a 30 nautical mile radius of the mouth of Delaware Bay, as well as prohibit the transfer of horseshoe crabs in federal waters. A horseshoe crab reserve was established on March 7, 2001, by NMFS in the area recommended by ASMFC. This area is now known as the Carl N. Shuster Jr. Horseshoe Crab Reserve (Figure 1).

In 2001, the Horseshoe Crab Management Board approved Addendum II to the FMP. The purpose of Addendum II was to allow the voluntary transfer of harvest quotas between states to alleviate concerns over potential bait shortages on a biologically responsible basis. Voluntary quota transfers require Technical Committee review and Management Board approval.

In 2004, the Board approved Addendum III to the FMP. The addendum sought to further the conservation of horseshoe crab and migratory shorebird populations in and around the Delaware Bay. It reduced harvest quotas and implemented seasonal bait harvest closures in New Jersey, Delaware, and Maryland, and revised monitoring components for all jurisdictions.

Addendum IV was approved in 2006. It further limited bait harvest in New Jersey and Delaware to 100,000 crabs (male only) and required a delayed harvest in Maryland and Virginia.

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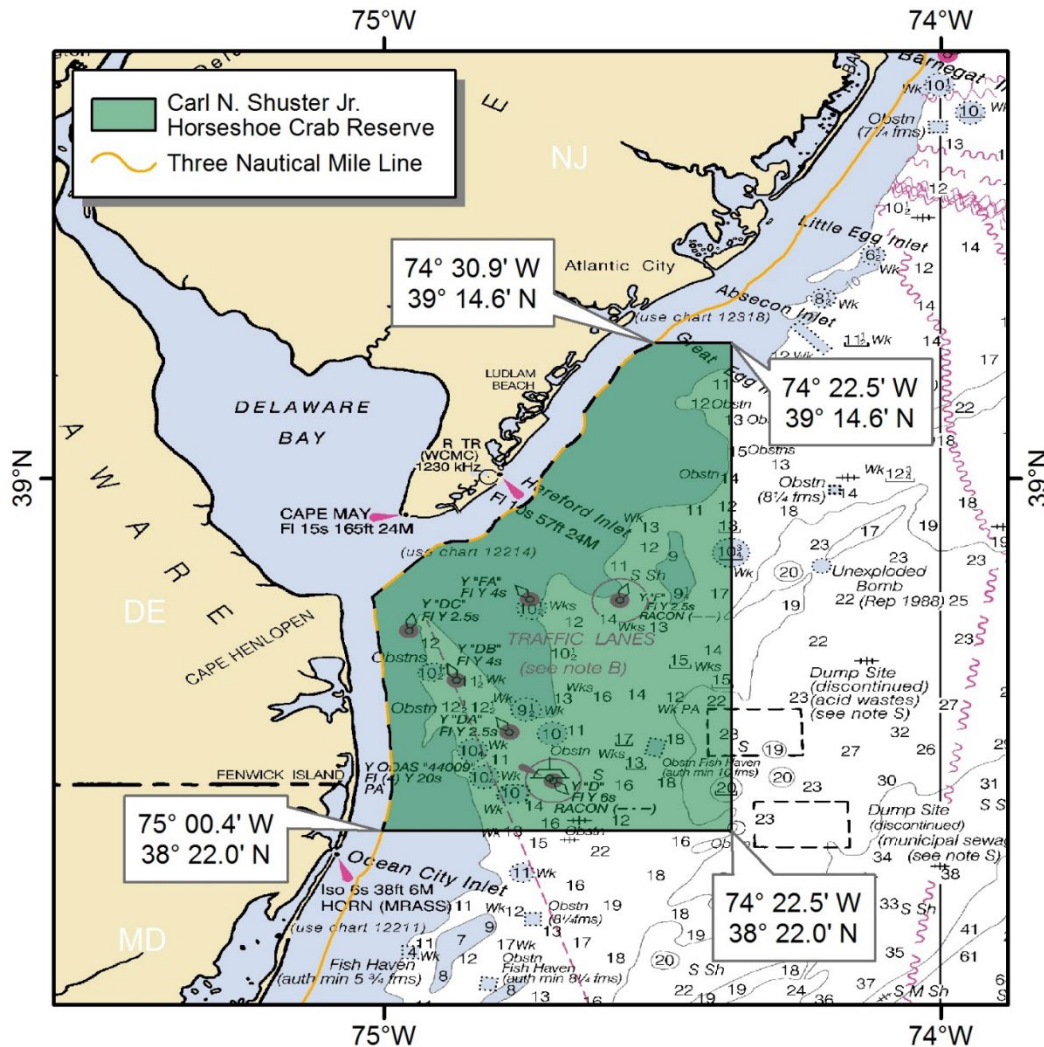


Figure 1. Carl N. Shuster Jr Horseshoe Crab Reserve.

Addendum V, adopted in 2008, extended the provisions of Addendum IV through October 31, 2010.

In early 2010, the Board initiated Draft Addendum VI to consider management options that would follow expiration of Addendum V. The Board voted in August 2010 to extend the Addendum V provisions, via Addendum VI, through April 30, 2013. The Board also chose to include language allowing them to replace Addendum VI with another Addendum during that time, in anticipation of implementing an Adaptive Resource Management (ARM) Framework.

The Board approved Addendum VII in February 2012. This addendum implemented an ARM framework for use during the 2013 fishing season and beyond. The framework considers the abundance levels of horseshoe crabs and shorebirds in determining the optimized bait harvest level for the Delaware Bay states of New Jersey, Delaware, Maryland, and Virginia (east of the COLREGS).

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The ARM Framework underwent a revision process in 2021 to incorporate more available data and update the software platform. Several improvements were made to the ARM Framework during this revision. The ARM Revision improves the population models for horseshoe crabs and red knots by incorporating Delaware Bay region-specific data collected over the past few decades. Horseshoe crab population estimates from the Catch Multiple Survey Analysis (CMSA) model used in the 2019 Benchmark Stock Assessment were incorporated into the ARM Revision. Additionally, the ARM Revision includes more sources of horseshoe crab removals than the previous version, adding mortality in the biomedical industry and commercial discards from other fisheries. The maximum number of male and female horseshoe crabs the ARM Revision can recommend remains the same at 210,000 females and 500,000 males. However, harvest recommendations under the ARM Revision are now based on a continuous scale rather than the fixed harvest packages in the previous Framework. Also, the harvest of females is decoupled from the harvest of males so that each are determined separately. While additional data and model improvements are used in the ARM Revision, the conceptual model of horseshoe crab abundance influencing red knot survival and reproduction remains intact with the intent of ensuring the abundance of horseshoe crabs does not become a limiting factor in the population growth of red knots.

After accepting the ARM Revision and Peer Review for management use in January 2022, the Board initiated Draft Addendum VIII to consider allowing its use in setting annual specifications for horseshoe crabs of Delaware Bay-origin.

II. Status of the Stock and Assessment Advice

A benchmark stock assessment was completed and approved for management use in 2019. The assessment report is available at:

http://www.asmfc.org/uploads/file/5cd5d6f1HSCAssessment_PeerReviewReport_May2019.pdf

This assessment was the first to successfully apply a stock assessment model to a component of the horseshoe crab stock. A Catch Multiple Survey Analysis (CMSA) model, a stage-based model that tracks progression of crab abundances from pre-recruits to full recruits to the fishery, was applied to female crabs in the Delaware (DE) Bay region (New Jersey-Virginia). This model estimated regional female crab abundance using relative abundance information from the Virginia Tech Benthic Trawl Survey, New Jersey Ocean Trawl Survey, and Delaware Adult Trawl Survey, and estimates of mortality including natural mortality, commercial bait harvest, commercial discard mortality, and mortality associated with biomedical use. While reference points were not approved to determine stock status, the CMSA population estimates were recommended as the best estimates for female horseshoe crab abundance in the DE Bay region.

The base CMSA model population estimates show an increase in the number of female crabs in the DE Bay region since 2012, when the ARM Framework was established via Addendum VII. This increasing trend is supported by positive trends in regional fishery-independent surveys

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during this time period. Population estimates from the base model are not publicly available due to the inclusion of confidential biomedical data. However, a sensitivity run assuming no biomedical mortality is publicly viewable, and these estimates are not significantly different from the base model results. Estimates of discard mortality from the Northeast Fisheries Observer Program (NEFOP) were also included in the base CMSA model and indicate that discard mortality could be significant, of similar or greater magnitude than mortality due to bait harvest. Population estimates from the CMSA are currently being considered for incorporation into the ARM Framework, which is applied annually to specify bait harvest quotas for the DE Bay region.

Autoregressive Integrated Moving Average (ARIMA) models, similar to those used in previous assessments, were applied to all regions. ARIMA models were fit to fishery-independent survey indices trends of abundance in each of the regional horseshoe crab populations: Northeast (Massachusetts-Rhode Island), New York (Connecticut-New York), DE Bay, and Southeast (North Carolina-Florida). No definitions for overfishing or overfished status have been adopted by the Management Board. However, the assessment characterized the status of each regional and the coastwide population based on the percentage of surveys within a region (or coastwide) having a >50% probability of the terminal year being below the ARIMA reference point. The ARIMA reference point was the 1998 index for each survey. “Poor” status was defined as >66% of surveys meeting this criterion, “Good” status was defined as <33% of surveys, and “Neutral” status was defined as 34–65% of surveys. Based on these criteria, stock status was neutral for the Northeast region, poor for the New York region, neutral for the Delaware Bay region, and good for the Southeast region. Coastwide, abundance has fluctuated through time with many surveys decreasing after 1998 but increasing in recent years. The coastwide status includes surveys from all regions and indicates a neutral trend, likely due to a combination of positive and negative trends.

III. Status of the Fishery

Bait Fishery

For most states, the bait fishery is open year-round. However, because of seasonal horseshoe crab movements (to the beaches in the spring; deeper waters and offshore in the winter), the fishery operates at different times along the coast. New Jersey has prohibited commercial harvest of horseshoe crabs in state waters since 2006. State waters of Delaware are closed to horseshoe crab harvest and landing from January 1st through June 7th each year, and other state horseshoe crab fisheries are regulated with various season/area closures.

The total reported bait landings in 2021 totaled 724,192 crabs (excluding landings from Connecticut¹). This is well below the ASMFC coastwide quota of 1,587,274 crabs (Table 1,

¹ At the time of drafting this report, the Commission has not yet received a compliance report from Connecticut. Thus, all coastwide data provided in this report exclude data from Connecticut.

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Figure 2) and represents a 58% increase from 2020 landings of 455,831 crabs. Landings increased in New York, Delaware, Maryland, and Virginia. It is likely that 2020 bait landings were depressed due to the COVID-19 pandemic restricting harvest effort, thus the 2021 landings are more similar to 2019 levels.

Reported coastwide landings since 1998 show more male than female horseshoe crabs were harvested annually. Several states presently have sex-specific restrictions in place which limit or ban the harvest of females. The American eel pot fishery prefers egg-laden female horseshoe crabs as bait, while the whelk (conch) pot fishery is less dependent on females. States with greater than 5% of coastal landings are required to report sex for at least a portion of their bait harvest; for 2021 these states include Massachusetts, New York, Delaware, Maryland, and Virginia. Within these states, 68% of reported bait landings were male, 16% were female, and 16% were unclassified in 2021.

The hand, trawl, and dredge fisheries accounted for the majority of reported commercial horseshoe crab bait landings in 2021. Other gears that account for the remainder of the harvest include rakes, hoes, and tongs, fixed nets, and gill nets.

Table 1. Reported commercial horseshoe crab bait landings by jurisdiction. Note: Landings from 2017 and earlier were updated to numbers validated by all jurisdictions for use in the 2019 benchmark stock assessment. "C" indicates confidential landings.

Jurisdiction	ASMFC Quota 2021	State Quota 2021	2021	2020	2019	2018	2017	2016
MA	330,377	165,000	156,013	163,695	172,664	159,002	134,707	110,399
RI	26,053	8,398	1,706	C	C	1,889	3,415	20,676
CT	48,689	48,689	***	15,942	17,588	21,870	19,944	21,945
NY	366,272	150,000	97,860	63,367	167,181	138,223	195,717	176,632
NJ*	162,136	0	0	0	0	0	0	0
DE*	162,136	157,122	172,927	124,803	164,225	126,065	201,132	109,836
MD*	255,980	255,980	181,044	61,165	145,907	66,647	237,146	157,013
PRFC	0	0	0	0	0	0	0	0
VA**	172,828	172,828	112,497	24,031	151,727	140,584	160,331	128,848
NC	24,036	24,036	2,145	3,672	13,463	10,998	25,161	25,197
SC	0	0	0	0	0	0	0	0
GA	29,312	29,312	0	0	0	0	0	0
FL	9,455	9,455	C	0	0	C	1,394	689
TOTAL	1,587,274	1,020,820	724,192	456,675	832,755	665,278	978,947	751,235

*Male-only harvest

**Virginia harvest east of the COLREGS line is limited to 81,331 male-only crabs under the ARM harvest package #3. Virginia harvest east of the COLREGS in 2021 is confidential.

***Connecticut landings were not provided.

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Biomedical Use

The horseshoe crab is an important resource for research and manufacture of materials used for human health. There are five companies along the Atlantic Coast that process horseshoe crab blood for use in manufacturing Limulus Amebocyte Lysate (LAL): Associates of Cape Cod, Massachusetts; Lonza (formerly Cambrex Bioscience), Limuli Laboratories, New Jersey; Wako Chemicals, Virginia; and Charles River Endosafe, South Carolina. Addendum III requires states where horseshoe crabs are collected for biomedical purposes to collect and report total collection numbers, crabs rejected, crabs bled (by sex) and to characterize mortality.

The Plan Review Team (PRT) annually calculates total coastwide collections and estimates mortality associated with biomedical use. In 2021, 718,809 crabs were collected coastwide solely for biomedical purposes² (Table 2). This represents a 3% increase from 2020. Males accounted for 56.5% of total biomedical collections in 2021 and females comprised 43.5%. Some crabs were rejected prior to bleeding due to mortality, injuries, slow movement, and size (mortality observed while crabs were going through the biomedical process is included under 'Observed Mortality' in Table 2). Approximately 1.7% of crabs collected solely for biomedical purposes were observed and reported as dead from the time of collection up to the point of bleeding.

During the 2019 benchmark stock assessment, a meta-analysis of literature estimates was performed to estimate post-bleeding mortality of horseshoe crabs. Although many of these studies did not implement biomedical best practices, these values are the only available estimates of mortality experienced after bleeding. Based on the literature review, post-bleeding mortality is estimated at 15%. Tagging data was used in the assessment to compare survivorship between crabs that were and were not bled. These results indicated some decrease in short-term survivorship, but greater long-term survivorship for bled crabs. These results are likely attributable to the culling process used by biomedical facilities to select healthy crabs for bleeding.

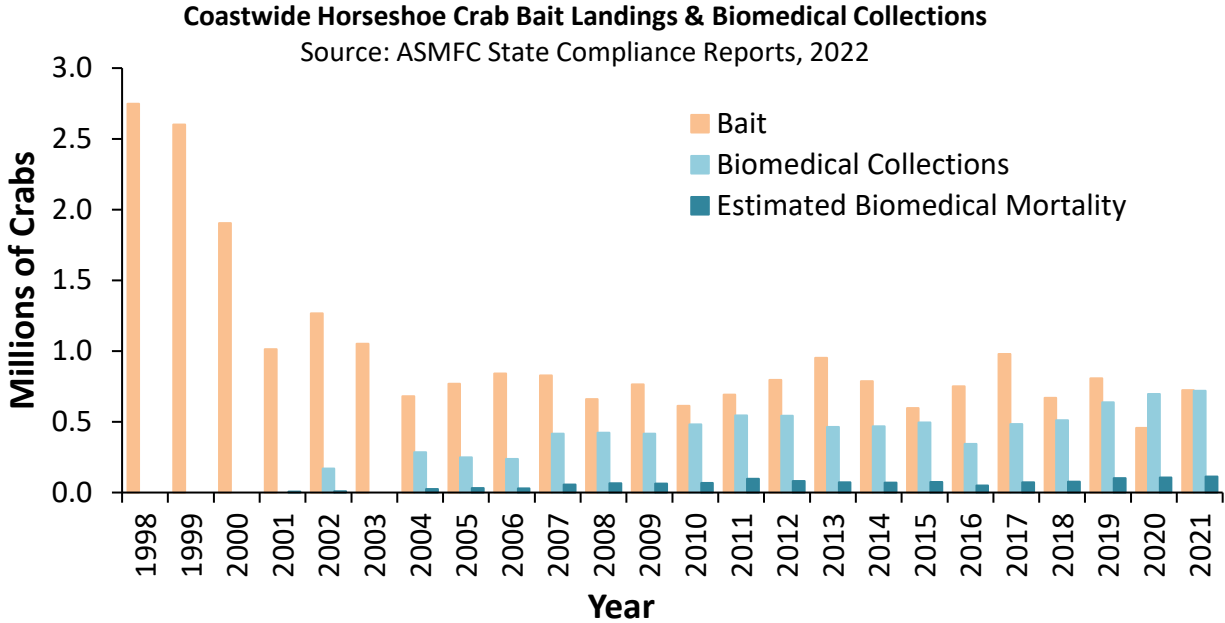
Post-bleeding mortality, calculated as 15% of the number of bled biomedical-only crabs (not from the bait market), for 2021 was estimated as 100,193 crabs. Total mortality (observed mortality plus post-bleeding mortality) of biomedical crabs for 2021 was estimated at 112,104 crabs. The total estimated mortality from biomedical collections represents approximately 13%

² This does not include bait crabs that were borrowed for bleeding and then returned to the bait market; these are counted against state bait quotas. The dual use of horseshoe crabs harvested for bait is encouraged as a conservation tool. Facilities that bleed horseshoe crabs to manufacture LAL can utilize crabs from the bait market in what is often referred to as the "rent a crab" program. Permitted bait harvesters and/or dealers can "rent" crabs caught for the bait industry to the bleeding facility; these crabs are returned to the bait vendor after bleeding. These crabs are caught under bait permits, are counted against the bait quota of the state of origin, and must comply with that state's regulations for bait harvest. The dual use of crabs in this program can reduce overall harvest, may decrease overall mortality, can provide the LAL manufacturers with an additional source of raw material, and may offer harvesters and dealers opportunity within this secondary market.

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of the 2021 total directed use mortality (836,296 crabs), which includes both total biomedical mortality and removals for bait (excluding bait landings from CT).

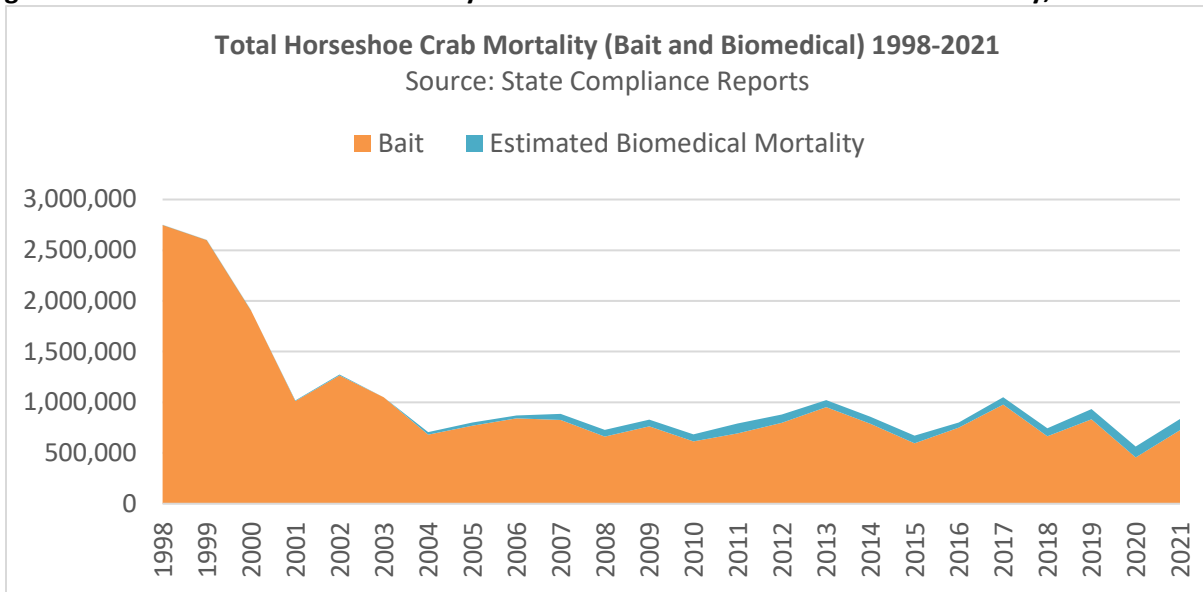
Figure 2. Number of horseshoe crabs harvested for bait and collected for biomedical purposes, 1998-2021.



*Biomedical collections are annually reported to the Commission and include all horseshoe crabs brought to bleeding facilities except those that were harvested as bait, “rented” by biomedical facilities and counted against state bait quotas.

*Crabs collected solely for biomedical crabs are returned to the water after bleeding; a 15% mortality rate is assumed for all bled crabs that are released. This number plus observed mortality reported annually by bleeding facilities via state compliance reports equals the 'Estimated Biomedical Mortality.'

Figure 3. Total Horseshoe Crab Mortality from Bait and Estimated Biomedical Mortality, 1998-2021.



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Table 2. Numbers of horseshoe crabs collected, bled, and estimated mortality for the biomedical industry. Numbers shown are for crabs collected solely for biomedical use. Mortality of bled crabs that later enter the bait industry is included in bait harvest.

Year	Crabs Collected	Crabs Bled	Post-Bleeding Mortality	Observed Mortality	Total Mortality
2010	480,914	412,781	61,917	6,829	68,746
2011	545,164	486,850	73,028	24,139	97,166
2012	541,956	497,956	74,693	7,370	82,063
2013	464,657	440,402	66,060	5,447	71,507
2014	467,897	432,340	64,851	5,658	70,509
2015	494,123	464,506	69,676	5,362	75,038
2016*	344,495	318,523	47,778	1,004	48,782
2017	483,245	444,115	66,617	6,056	72,674
2018	510,407	479,142	71,871	5,588	77,459
2019	637,029	589,361	88,404	12,789	101,193
2020	697,025	649,546	97,432	8,907	106,339
2021	718,809	667,951	100,193	11,911	112,104

***Some biomedical collections were reduced in 2016 due to temporary changes in production.**

IV. Status of Research and Monitoring

The Horseshoe Crab FMP set forth an ambitious research and monitoring strategy in 1999 and again in 2004 to inform future management decisions. Despite limited time and funding there are many accomplishments since 1999. These accomplishments were largely made possible by forming partnerships between state, federal and private organizations, and the support of hundreds of public volunteers.

Addendum III Monitoring Program

Addendum III requires affected states to carry out three monitoring components:

1. All states who do not qualify for *de minimis* status report monthly harvest numbers and subsample a portion of the catch for sex and harvest method. In addition, those states with annual landings above 5% of the coastwide harvest report all landings by sex and harvest method. Although states with annual landings less than 5% of annual coastwide harvest are not required to report landings by sex, the PRT recommends all states require sex-specific reporting for horseshoe crab harvest.
2. States with biomedical collections are required to monitor and report collection numbers and mortality associated with the transportation and bleeding of the crabs.
3. States must identify spawning and nursery habitat along their coasts. All states have completed this requirement, and a few continue active monitoring programs.

Virginia Tech Research Projects

The Virginia Tech Horseshoe Crab Trawl Survey (VT Survey) was not conducted in 2013-2015, due to a lack of funding, but was conducted in 2016-2021, and is in progress for 2022. Funding sources beyond 2022 continue to be explored. The 2021 surveys were conducted between August 10 and September 25.

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Analysis of the 2021 data resulted in the highest mean stratified catch-per-tow values within the Delaware Bay Area (DBA) over the time series for mature males, mature females, and newly mature males. These values were higher than the previous year's values for all demographic groups when a normal distribution was assumed for observations in each stratum. Mean stratified catch-per-tow for all demographic groups in the DBA continues to be highly variable, although mature individuals have shown a positive trend over the time series. Newly mature males also appear to show a slightly positive trend since 2002. Prosomal widths of all demographic groups, except immature females, show decreasing trends over the time series in the DBA.

The indices from this survey, along with the New Jersey Ocean Trawl and Delaware Fish and Wildlife Adult Trawl Survey indices, were used to estimate horseshoe crab abundance in the 2021 ARM Framework Revision to produce optimal harvest limits for the upcoming year.

Spawning Surveys

The redesigned Delaware Bay spawning survey was completed for the twenty-third consecutive year in 2021; twelve beaches in Delaware and ten beaches in New Jersey were sampled. Delaware is currently in the process of analyzing survey data.

Tagging Studies

The USFWS continues to maintain a toll-free telephone number and a website for reporting horseshoe crab tag returns and assists interested parties in obtaining tags. Tagging work continues to be conducted by biomedical companies, research organizations, and other parties involved in outreach and spawning surveys. Beginning with the 2013 tagging season, additional efforts were implemented to ensure that current tagging programs are providing data that benefits the management of the coastwide horseshoe crab population. All existing and new tagging efforts are required to submit an annual application to be considered for the USFWS tagging program and all participants must submit an annual report along with their tagging and resighting data to indicate how their tagging program addresses at least one of the following objectives: determine horseshoe crab sub-population structure, estimate horseshoe crab movement and migration rates, and/or estimate survival and mortality of horseshoe crabs. The PRT recommends all tagging programs approved by the states coordinate with the USFWS tagging program, in order to ensure a consistent coastwide program to support management.

Since 1999, over 391,475 crabs have been tagged and released through the USFWS tagging program along the Atlantic coast, and 37,621 unique crabs have been recaptured. Crabs have been tagged and released from every state on the Atlantic Coast from Florida to New Hampshire. In the early years of the program, tagging was centered around Delaware Bay; however, in recent years, tagging has expanded and increased in Long Island Sound and the Southeast. Tagging information from this database has been used in the 2019 Benchmark Stock Assessment to define stock structure, estimate total mortality, and characterize impacts of biomedical use on crab mortality.

New York Region Monitoring

Following the 2019 Benchmark Stock Assessment, which characterized the status of the horseshoe crab population in the New York region as “Poor”, the Board directed the PRT to monitor fishery-independent surveys in this area to track progress of state management actions toward improving this regional population. During the assessment, five surveys were included in the ARIMA model to characterize this population. One of these, the Northeast Area Monitoring and Assessment Program (NEAMAP), includes sample areas outside of the New York region, making it too data-intensive to specify the regional index on an annual basis. The most recent information from the state-conducted surveys used in the assessment is summarized below, but can be viewed in greater detail in the Connecticut and New York state compliance reports. The Western Long Island (WLI) Little Neck Bay and Manhasset Bay seine surveys were combined in the assessment to form a single index, but are shown below separately. None of these beach seine surveys were completed in 2020 due to the COVID-19 pandemic but resumed in 2021. Figures 5-8 show the annual index for each survey over the time series until 2021.

Connecticut

- Long Island Sound Trawl (Fall) – 2020 index – **Due to the COVID-19 pandemic the LIS Trawl Survey did not take place. Sampling for LIS Trawl Survey was not authorized until Spring 2021, but results have not been provided.**

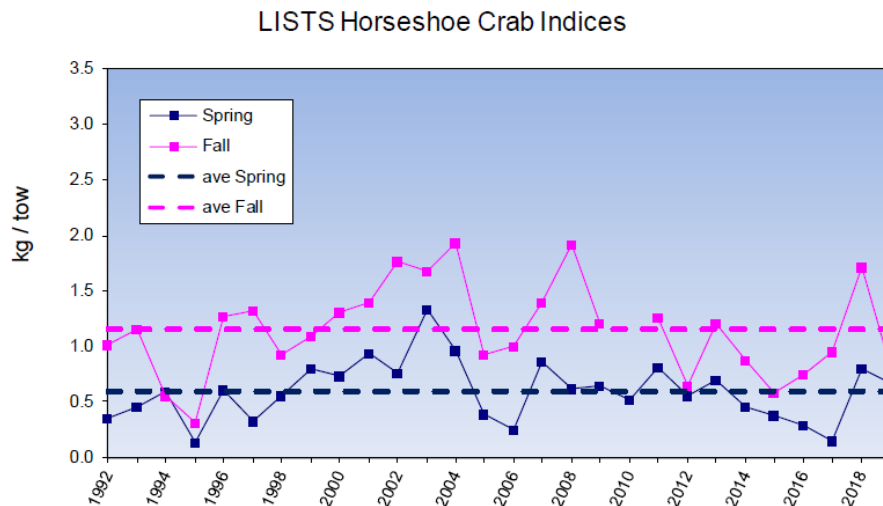


Figure 4. LISTS Horseshoe Crab Indices, 1992-2019.

New York

- Peconic Trawl – 2021 index = 0.13 (delta distribution average catch per unit effort [CPUE]), increase from 2019, below 2010-21 average.
- WLI Jamaica Bay Seine (all horseshoe crabs) – 2021 index = 0.78 (geometric mean), increase from 2019, above 2010-21 average.
- WLI Little Neck Bay Seine (all) – 2021 index = 0.46 (geometric mean), decrease from 2019, below 2010-19 average.

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- WLI Manhasset Bay Seine (all) – 2021 index = 0.68 (geometric mean), decrease from 2019, below 2010-19 average.

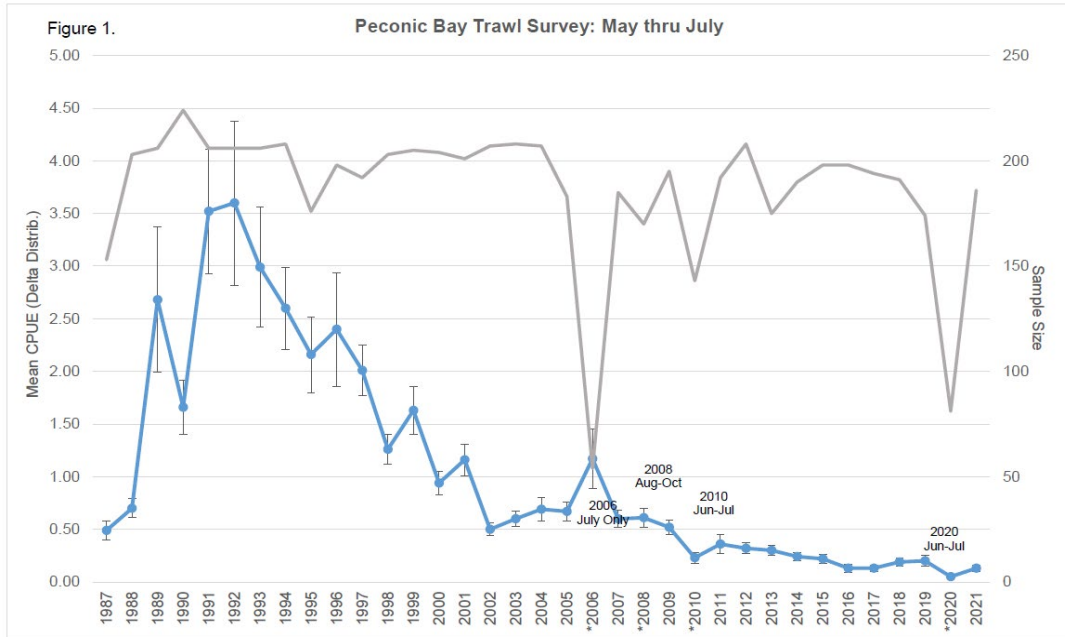


Figure 5. Peconic Bay Trawl Survey: May through July, 1987-2021. (gray line=sample size, blue line=mean CPUE).

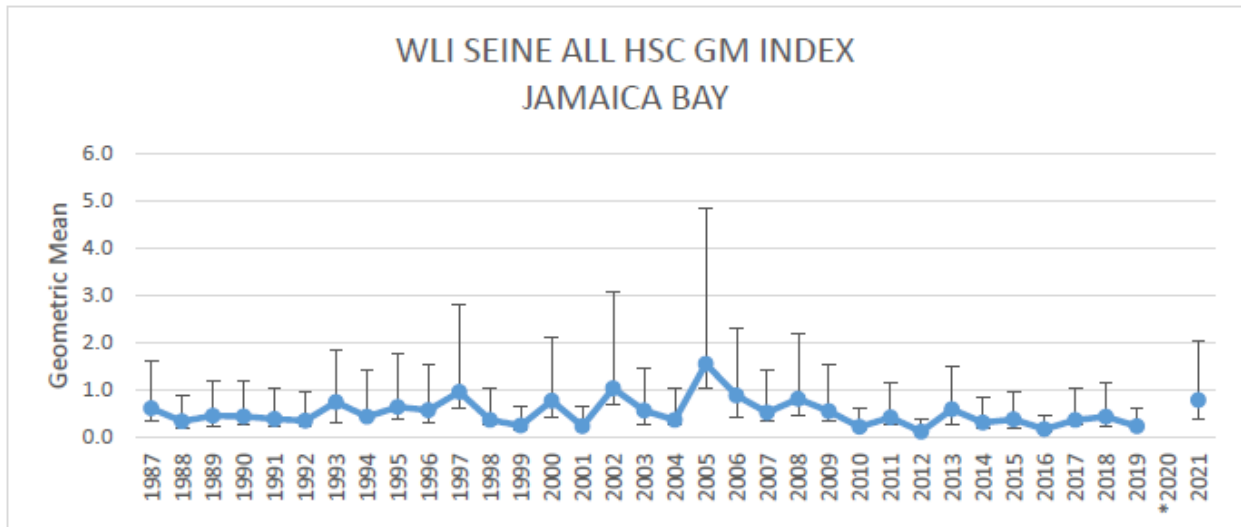


Figure 6. NYSDEC WLI Jamaica Bay Beach Seine Survey All Horseshoe Crab GM Index, 1987-2021. *Due to the COVID-19 pandemic, in 2020 sampling did not begin until July.

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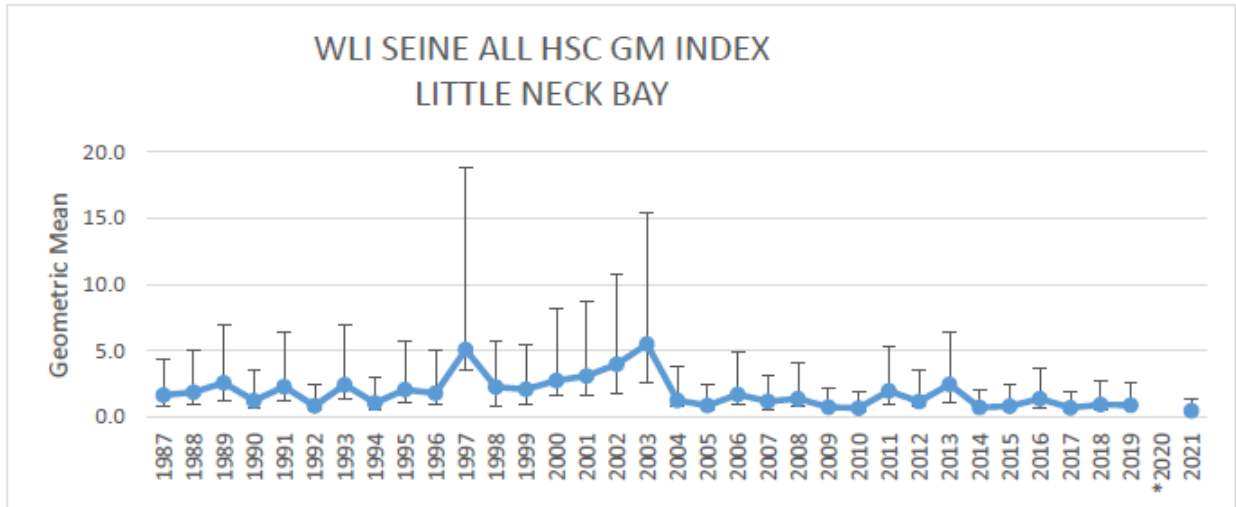


Figure 7. Little Neck Bay Seine Survey All Horseshoe Crab GM Index, 1987-2021. *Due to the COVID-19 pandemic, in 2020 sampling did not begin until July.

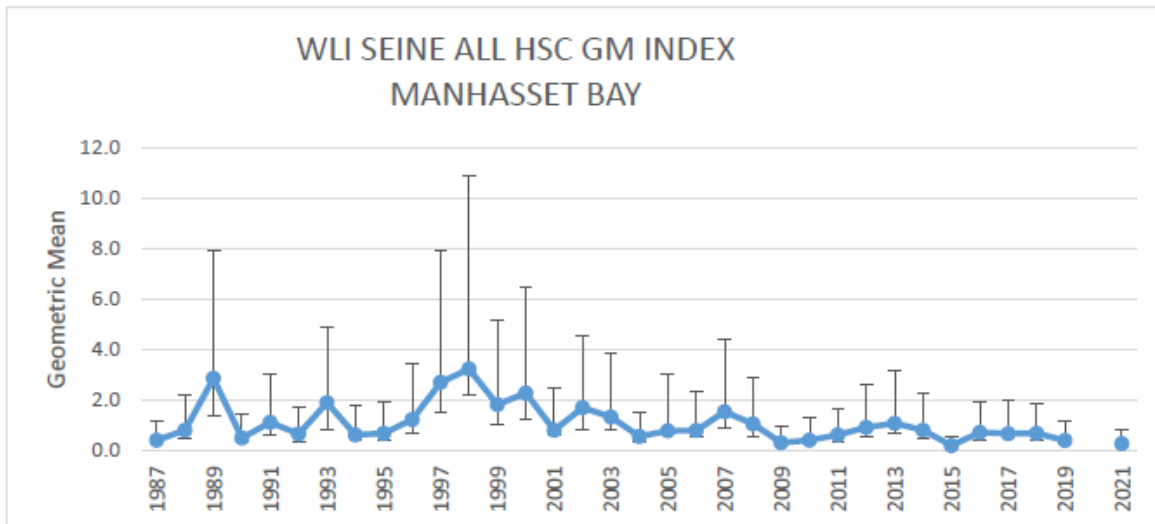


Figure 8. Manhasset Bay Seine Survey All Horseshoe Crab GM Index, 1987-2019. *Due to the COVID-19 pandemic, in 2020 sampling did not begin until July.

V. Status of Management Measures and Issues

ASMFC

Initial state harvest quotas were established through Addendum I. Addendum III outlined the monitoring requirements and recommendations for the states. Addendum IV set harvest closures and quotas, and other restrictions for New Jersey, Delaware, Maryland, and Virginia, which were continued in Addenda V and VI.

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In February 2012 the Board approved Addendum VII to implement the ARM Framework; it was implemented in 2013. Addendum VII includes an allocation mechanism to divide the Delaware Bay optimized harvest output from the ARM Framework among the four Delaware Bay states (New Jersey, Delaware, Maryland, and Virginia east of the COLREGS line). Season closures and restrictions present within Addendum VI remain in effect as part of Addendum VII.

State-specific charts outlining compliance and monitoring measures are included in Section VII. Issues noted by the PRT include:

1. In 2021, Delaware's bait harvest exceeded the ASMFC quota of 162,136 male crabs by 10,791 crabs. Delaware's 2021 overage will be deducted from the 2022 quota.
2. Connecticut did not provide an annual compliance report.
3. Massachusetts did not report to ASMFC by the required deadline.

Except for required sampling that was not completed due to the COVID-19 pandemic, the PRT finds that all other jurisdictions appear to be in compliance with the FMP and subsequent Addenda in 2021.

Changes to State Regulations

No changes were made to state regulations for fishing year 2021.

Alternative Baits

Trials testing effectiveness of alternative baits to horseshoe crab for the American eel and whelk fisheries have previously been conducted. Additionally, a survey of bait usage in the eel and whelk fisheries was conducted in 2017. This survey is available at: http://www.asmf.org/uploads/file/5a04b785HSC_BaitSurveyTCReport_Oct2017.pdf.

Shorebirds

The USFWS received petitions in 2004 and 2005 to emergency list the red knot under the Endangered Species Act. In fall 2005, it determined that emergency listing was not warranted at the time. As part of a court settlement, the USFWS agreed to initiate proposed listings of over 200 species, including the red knot. In fall 2013, the USFWS released a proposal for listing the red knot as threatened. In January 2015 the USFWS designated the red knot as threatened under the Endangered Species Act.

In 2022 the USFWS conducted an analysis of the changes to horseshoe crab management that would occur under the 2021 ARM Revision to determine the likelihood of impacts to the red knot. The finding from analysis is that there is a < 1% chance of a red knot population decline due to the implementation of potential female harvest under the revised ARM. Therefore, the Service concluded that take, defined under the Endangered Species Act as killing or injuring, of red knots is not likely.

The red knot has been listed as an endangered species in the state of New Jersey since 2012.

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VI. PRT Recommendations and Research Needs

De Minimis

States may apply for *de minimis* status if, for the last two years, their combined average horseshoe crab bait landings (by numbers) constitute less than one percent of coastwide horseshoe crab bait landings for the same two-year period. States may petition the Board at any time for *de minimis* status, if their fishery falls below the threshold level. Once *de minimis* status is granted, designated States must submit annual reports to the Board justifying the continuance of *de minimis* status.

States that qualify for *de minimis* status are not required to implement any horseshoe crab harvest restriction measures, but are required to implement components A, B, E and F of the monitoring program (Section 3.5 of the FMP; further modified by Addendum III). Since *de minimis* states are exempt from a harvest cap, there is potential for horseshoe crab landings to shift to *de minimis* states and become substantial, before adequate action can be taken. To control shifts in horseshoe crab landings, *de minimis* states are encouraged to implement one of the following management measures:

1. Close their respective horseshoe crab bait fishery when landings exceed the *de minimis* threshold;
2. Establish a state horseshoe crab landing permit, making it only available to individuals with a history of landing horseshoe crabs in that state; or
3. Establish a maximum daily harvest limit of up to 25 horseshoe crabs per person per day. States which implement this measure can be relieved of mandatory monthly reporting, but must report all horseshoe crabs harvests on an annual basis.

The following states have been removed from the Management Board since its formation: Pennsylvania (2007), Maine (2011), and New Hampshire (2014). South Carolina, Georgia, and Florida are requesting *de minimis* status for the 2022 fishing season based on the 2020-21 season landings and meet the FMP requirements for being granted this status (Table 1). The PRT recommends granting these jurisdictions *de minimis* status.

Biomedical Threshold

The 1998 FMP established a biomedical mortality threshold of 57,500 crabs that, if exceeded, requires the Board to consider management action. This threshold has been exceeded in all but one year since 2008. Results of the 2019 Benchmark Stock Assessment indicate that levels of biomedical mortality prior to 2017 (the terminal year of data used in the assessment) did not have a significant effect on horseshoe crab population estimates or fishing mortality in the Delaware Bay region.

In 2020 the Board tasked the PDT to review the threshold for biomedical use to develop biologically-based options for the threshold and to develop options for action when the threshold is exceeded. It also tasked the PDT to review the best management practices (BMPs)

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for handling biomedical catch and suggest options for updating and implementing BMPs. The PDT concluded that given the lack of coastwide population estimates for horseshoe crabs, it is not possible to develop a biologically-based threshold for biomedical mortality. Thus, the PDT did not recommend a change to the threshold. Based on this information the Board determined no action is warranted, but agreed to form a work group to review and update the best management practices for biomedical handling to further reduce stress, injury, and mortality to horseshoe crabs collected for biomedical purposes if possible.

Funding for Research and Monitoring Activities

The PRT strongly recommends the funding and continuation of the VT benthic trawl survey. This effort provides a statistically reliable estimate of horseshoe crab relative abundance that is essential to continued ARM implementation and use of the CMSA stock assessment model.

Discard Mortality Estimation

Results of the 2019 Benchmark Stock Assessment indicate that discard mortality may be significant, of similar or greater magnitude than bait harvest. The Review Panel's report indicated that these estimates could be further refined to reduce their uncertainty and more precisely characterize this mortality source. The PRT recommends the Board take steps to increase access to and use of data from the NEFOP, allowing for improved monitoring and estimation of discard mortality.

Improvement of the New York Regional Population

Results of the 2019 Benchmark Stock Assessment indicate a "Poor" status for the New York regional population, due to negative trends in regional abundance indices. New York and Connecticut have indicated that they will take actions within their states to improve this population. The PRT recommends that the Board encourage such actions to continue so that this population's status may improve.

The PRT will continue to annually report regional indices of abundance so that progress of management actions may be tracked through the annual FMP Reviews.

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VII. State Compliance and Monitoring Measures

MASSACHUSETTS		
	2021 Compliance	2022 Management Proposal
<i>De minimis</i> status	Did not request <i>de minimis</i>	Did not request <i>de minimis</i>
Bait Harvest Restrictions and Landings		
- ASMFC Quota (Voluntary State Quota)	330,377 (165,000)	330,377 (165,000)
- Other Restrictions	Bait: 300 crab daily limit year round; limited entry; Biomedical: 1,000 crab daily limit; Conch pot and eel fishermen: no possession limit Mobile gear: 75 crab trip limit, exempted from “no-fishing days” starting 10/9/2020; All: May and June 5-day lunar closures; 7” PW minimum size; Pleasant Bay Closed Area	Bait: 300 crab daily limit year round; Biomedical: 1,000 crab daily limit; Conch pot and eel fishermen: no possession limit All: May and June 5-day lunar closures; No mobile gear harvest Fri-Sat during summer flounder season; 7” PW minimum size; Pleasant Bay Closed Area
- Landings	156,013	--
Monitoring Component A ₁		
- Mandatory monthly reporting	Yes, plus weekly dealer reporting through SAFIS	Yes, plus weekly dealer reporting through SAFIS
- Characterize commercial bait fishery	Yes	Yes
Monitoring Component A ₂		
- Biomedical reporting	Yes	Yes
- Required information for biomedical use of crabs	Yes	Yes
Monitoring Component A₃ Identify spawning and nursery habitat	Yes	Not Applicable
Monitoring Component B₁ Coastwide benthic trawl survey	Yes, VT Trawl Survey was conducted in 2021	Yes, VT Trawl Survey will be conducted in 2022; future years and spatial scope unknown at this time
Monitoring Component B₂ Continue existing benthic sampling programs	Yes	Yes
Monitoring Component B₃ Implement spawning survey	Yes	Yes
Monitoring Component B₄ Tagging program	Yes – w/NPS and USFWS; Pleasant Bay, Monomy NWR, Waquoit Bay	Yes – w/NPS and USFWS; Pleasant Bay, Monomy NWR, Waquoit Bay

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RHODE ISLAND		
	2021 Compliance	2022 Management Proposal
<i>De minimis</i> status	Did not request <i>de minimis</i>	Did not request <i>de minimis</i>
Bait Harvest Restrictions and Landings		
- ASMFC Quota (Voluntary State Quota)	26,053 (8,398)	26,053 (8,398)
- Other Restrictions	State Restrictions: - Daily possession limit: 60 crabs per permit - Bait Fishery Closure: May 1- May 31 - Biomedical Fishery Closure: 48 hours prior to and 48 hours following new and full moons during May. - Biomedical quota and best management practices	State Restrictions: - Daily possession limit: 60 crabs per permit - Bait Fishery Closure: May 1- May 31 - Biomedical Fishery Closure: 48 hours prior to and 48 hours following new and full moons during May - Biomedical quota and best management practices
- Landings	1,706	--
Monitoring Component A ₁		
- Mandatory monthly reporting	Yes, weekly call in and monthly on paper	Yes, weekly call in and monthly on paper
- Characterize commercial bait fishery	Yes	Yes
Monitoring Component A ₂		
- Biomedical reporting	Yes	Yes
- Required information for biomedical use of crabs	Yes, details within Massachusetts' biomedical reports	Captured in Massachusetts' biomedical reports
Monitoring Component A₃ Identify spawning and nursery habitat	Yes	Not Applicable
Monitoring Component B₁ Coastwide benthic trawl survey	Yes, VT Trawl Survey was conducted in 2021	Yes, VT Trawl Survey will be conducted in 2022; future years and spatial scope unknown at this time
Monitoring Component B₂ Continue existing benthic sampling programs	Yes	Yes
Monitoring Component B₃ Implement spawning survey	Yes, since 2000	Yes
Monitoring Component B₄ Tagging program	State Wildlife Grant for 2020-2021 tagging program in collaboration with University of Rhode Island.	State Wildlife Grant for 2020-2021 tagging program in collaboration with URI. Status unknown beyond 2021.

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CONNECTICUT – 2021 REPORT NOT PROVIDED		
	2021 Compliance	2022 Management Proposal
<i>De minimis</i> status	Did not request <i>de minimis</i>	Not provided
Bait Harvest Restrictions and Landings		
- ASMFC Quota	48,689	48,689
- Other Restrictions	Limited entry program, possession limits, and seasonal and area closures	Limited entry program, possession limits, and seasonal and area closures
- Landings	Not provided	--
Monitoring Component A ₁		
- Mandatory monthly reporting	Not provided	Yes
- Characterize commercial bait fishery	No – exempt under Addendum III because landings are < 5% of coastwide total	No – exempt under Addendum III because landings are < 5% of coastwide total
Monitoring Component A ₂		
- Biomedical reporting	Not Applicable	Not Applicable
- Required information for biomedical use of crabs	Not Applicable	Not Applicable
Monitoring Component A₃ Identify spawning and nursery habitat	Not provided	Not Applicable
Monitoring Component B₁ Coastwide benthic trawl survey	Yes, VT Trawl Survey was conducted in 2021	Yes, VT Trawl Survey will be conducted in 2022; future years and spatial scope unknown at this time
Monitoring Component B₂ Continue existing benthic sampling programs	Not provided	Yes
Monitoring Component B₃ Implement spawning survey	Yes, since 1999 (methods differ from DE Bay survey)	Yes
Monitoring Component B₄ Tagging program	Yes, in collaboration with local universities (Sacred Heart University since 2015)	Yes

DRAFT FOR BOARD REVIEW

NEW YORK		
	2021 Compliance	2022 Management Proposal
<i>De minimis status</i>	Did not request <i>de minimis</i>	Did not request <i>de minimis</i>
Bait Harvest Restrictions and Landings		
- ASMFC Quota (Voluntary State Quota)	366,272 (150,000)	366,272 (150,000)
- Other Restrictions	Ability to close areas to harvest; seasonal quotas and daily harvest limits Five-day lunar closures around the full moon in May and the new moon in June. Initial trip limit dropped to 150 crabs in period 2.	Ability to close areas to harvest; seasonal quotas and daily harvest limits - Five-day lunar closures around the full moon in May and the new moon in June. -Initial trip limit dropped to 150 crabs in period 2.
- Landings	97,860	--
Monitoring Component A ₁		
- Mandatory monthly reporting	Yes	Yes
- Characterize commercial bait fishery	Yes	Yes
Monitoring Component A ₂		
- Biomedical reporting	Yes	Yes
- Required information for biomedical use of crabs	Not Applicable	Not Applicable
Monitoring Component A₃ Identify spawning and nursery habitat	Yes	Not Applicable
Monitoring Component B₁ Coastwide benthic trawl survey	Yes, VT Trawl Survey was conducted in 2021	Yes, VT Trawl Survey will be conducted in 2022; future years and spatial scope unknown at this time
Monitoring Component B₂ Continue existing benthic sampling programs	Yes	Yes
Monitoring Component B₃ Implement spawning survey	Yes	Yes
Monitoring Component B₄ Tagging program	Yes	Yes

DRAFT FOR BOARD REVIEW

NEW JERSEY		
	2021 Compliance	2022 Management Proposal
<i>De minimis</i> status	Did not request <i>de minimis</i>	Does not request <i>de minimis</i>
Bait Harvest Restrictions and Landings		
- ASMFC Quota (Voluntary state quota)	162,136 [male only] (0)	162,136 [male only] (0)
- Other Restrictions	Bait harvest moratorium	Bait harvest moratorium
- Landings	0	--
Monitoring Component A ₁		
- Mandatory monthly reporting	Not Applicable	Not Applicable
- Characterize commercial bait fishery	Not Applicable	Not Applicable
Monitoring Component A ₂		
- Biomedical reporting	Yes	Yes
- Required information for biomedical use of crabs	Yes	Yes
Monitoring Component A₃ Identify spawning and nursery habitat	Yes	Not Applicable
Monitoring Component B₁ Coastwide benthic trawl survey	Yes, VT Trawl Survey was conducted in 2021	Yes, VT Trawl Survey will be conducted in 2022; future years and spatial scope unknown at this time
Monitoring Component B₂ Continue existing benthic sampling programs	No. Did not complete due to COVID-19.	Yes
Monitoring Component B₃ Implement spawning survey	Yes	Yes
Monitoring Component B₄ Tagging program	Outside, independent groups currently	No
Monitoring Component B₅ Egg abundance survey	Yes, but removed as a mandatory component	Yes
Monitoring Component B₆ Shorebird monitoring program	Yes	Yes

DRAFT FOR BOARD REVIEW

DELAWARE		
	2021 Compliance	2022 Management Proposal
<i>De minimis</i> status	Did not request <i>de minimis</i>	Did not request <i>de minimis</i>
Bait Harvest Restrictions and Landings		
- ASMFC Quota (State Quota)	162,136 [male only] 162,136 [male only]	162,136 [male only] 151,345 [male only]
- Other Restrictions	Closed season (January 1 – June 7); season closed on July 30	Closed season (January 1 – June 7)
- Landings	172,927 (male only)	--
Monitoring Component A ₁		
- Mandatory monthly reporting	Yes (daily call-in reports & monthly logbooks)	Yes
- Characterize commercial bait fishery	Yes	Yes
Monitoring Component A ₂		
- Biomedical reporting	Not Applicable	Not Applicable
- Required information for biomedical use of crabs	Not Applicable	Not Applicable
Monitoring Component A₃ Identify spawning and nursery habitat	Yes – updates once every 5 years or as needed	Yes – updates once every 5 years or as needed
Monitoring Component B₁ Coastwide benthic trawl survey	Yes, VT Trawl Survey was conducted in 2021	Yes, VT Trawl Survey will be conducted in 2022; future years and spatial scope unknown at this time
Monitoring Component B₂ Continue existing benthic sampling programs	Yes	Yes
Monitoring Component B₃ Implement spawning survey	Yes	Yes
Monitoring Component B₄ Tagging program	No state program but has assisted in the past with various Delaware Bay horseshoe crab tagging initiatives	No
Monitoring Component B₅ Egg abundance survey	Removed as component	Removed as component
Monitoring Component B₆ Shorebird monitoring program	Yes	Yes

Note: The egg abundance survey has been discontinued as a mandatory monitoring element. Delaware will include information on the survey if it continues, but is no longer required to perform the survey.

DRAFT FOR BOARD REVIEW

MARYLAND		
	2021 Compliance	2022 Management Proposal
<i>De minimis</i> status	Did not request <i>de minimis</i>	Did not request <i>de minimis</i>
Bait Harvest Restrictions and Landings		
- ASMFC Quota	255,980 (male only)	255,980 (male only)
- Other Restrictions	Delayed harvest and closed season/area combinations, catch limits	Delayed harvest and closed season/area combinations, catch limits
- Landings	181,040 (male only)	--
Monitoring Component A ₁		
- Mandatory monthly reporting	Yes (weekly reports for permit holders; monthly for non-permit holders)	Yes (weekly reports for permit holders; monthly for non-permit holders)
- Characterize commercial bait fishery	Yes	Yes
Monitoring Component A ₂		
- Biomedical reporting	Yes	Yes
- Required information for biomedical use of crabs	Yes	Yes
Monitoring Component A₃ Identify spawning and nursery habitat	Yes	Not Applicable
Monitoring Component B₁ Coastwide benthic trawl survey	Yes, VT Trawl Survey was conducted in 2021	Yes, VT Trawl Survey will be conducted in 2022; future years and spatial scope unknown at this time
Monitoring Component B₂ Continue existing benthic sampling programs	Yes	Yes
Monitoring Component B₃ Implement spawning survey	Yes	Yes
Monitoring Component B₄ Tagging program	Yes – through biomedical use	Yes – through biomedical use

DRAFT FOR BOARD REVIEW

POTOMAC RIVER FISHERIES COMMISSION		
	2021 Compliance	2022 Management Proposal
<i>De minimis</i> status	Did not request <i>de minimis</i>	Did not request <i>de minimis</i>
- Ability to close fishery if <i>de minimis</i> threshold is reached	No horseshoe crab fishery	No horseshoe crab fishery
- Daily possession limit <25 for <i>de minimis</i> state		
- HSC landing permit		
Bait Harvest Restrictions and Landings		
- ASMFC Quota	0	0
- Other Restrictions	None	None
- Landings	0	0
Monitoring Component A ₁		
- Mandatory monthly reporting	Yes - weekly	Yes - weekly
- Characterize commercial bait fishery	Not Applicable	Not Applicable
Monitoring Component A ₂		
- Biomedical reporting	Not Applicable	Not Applicable
- Required information for biomedical use of crabs	Not Applicable	Not Applicable
Monitoring Component A₃ Identify spawning and nursery habitat	Not Applicable	Not Applicable
Monitoring Component B₁ Coastwide benthic trawl survey	Yes, VT Trawl Survey was conducted in 2021	Yes, VT Trawl Survey will be conducted in 2022; future years and spatial scope unknown at this time
Monitoring Component B₂ Continue existing benthic sampling programs	Not Applicable	Not Applicable
Monitoring Component B₃ Implement spawning survey	Not Applicable	Not Applicable
Monitoring Component B₄ Tagging program	Not Applicable	Not Applicable

DRAFT FOR BOARD REVIEW

VIRGINIA		
	2021 Compliance	2022 Management Proposal
<i>De minimis</i> status	Did not request <i>de minimis</i>	Did not request <i>de minimis</i>
Bait Harvest Restrictions and Landings		
- ASMFC Quota	172,828 (81,331 male-only east of COLREGS line)	172,828 (81,331 male-only east of COLREGS line)
- Other Restrictions	Closed season (January 1 – June 7) for federal waters. Effective January 1, 2013 harvest of horseshoe crabs, from east of the COLREGS line, is limited to trawl gear and dredge gear only.	Closed season (January 1 – June 7) for federal waters. Effective January 1, 2013 harvest of horseshoe crabs, from east of the COLREGS line, is limited to trawl gear and dredge gear only.
- Landings	112,497 (75,239 males)	--
Monitoring Component A₁		
- Mandatory monthly reporting	Yes	Yes
- Characterize commercial bait fishery	Yes	Yes
Monitoring Component A₂		
- Biomedical reporting	No permits issued in 2021	Yes
- Required information for biomedical use of crabs	Yes	Yes
Monitoring Component A₃ Identify spawning and nursery habitat	Yes – completed	Not Applicable
Monitoring Component B₁ Coastwide benthic trawl survey	Yes, VT Trawl Survey was conducted in 2021	Yes, VT Trawl Survey will be conducted in 2022; future years and spatial scope unknown at this time
Monitoring Component B₂ Continue existing benthic sampling programs	Not Applicable	Not Applicable
Monitoring Component B₃ Implement spawning survey	No	No
Monitoring Component B₄ Tagging program	No	No

DRAFT FOR BOARD REVIEW

NORTH CAROLINA		
	2021 Compliance	2022 Management Proposal
<i>De minimis</i> status	Did not request <i>de minimis</i>	Did not request <i>de minimis</i>
Bait Harvest Restrictions and Landings		
- ASMFC Quota	24,036	24,036
- Other Restrictions	Trip limit of 50 crabs; Proclamation authority to adjust trip limits, seasons, etc.	Trip limit of 50 crabs; Proclamation authority to adjust trip limits, seasons, etc.
- Landings	2,145	--
Monitoring Component A ₁		
- Mandatory monthly reporting	Yes	Yes
- Characterize commercial bait fishery	Yes	Yes
Monitoring Component A ₂		
- Biomedical reporting	Not Applicable	Not Applicable
- Required information for biomedical use of crabs	Not Applicable	Not Applicable
Monitoring Component A₃ Identify spawning and nursery habitat	Little information available; Survey discontinued after 2002 and 2003 due to low levels of crabs recorded	Not Applicable
Monitoring Component B₁ Coastwide benthic trawl survey	Yes, VT Trawl Survey was conducted in 2021	Yes, VT Trawl Survey will be conducted in 2022; future years and spatial scope unknown at this time
Monitoring Component B₂ Continue existing benthic sampling programs	Yes	Yes
Monitoring Component B₃ Implement spawning survey	No	No
Monitoring Component B₄ Tagging program	No	No

DRAFT FOR BOARD REVIEW

SOUTH CAROLINA		
	2021 Compliance	2022 Management Proposal
<i>De minimis</i> status	<i>De minimis</i> status granted for 2021.	<i>De minimis</i> requested for 2022 and meets criteria.
- Ability to close fishery if <i>de minimis</i> threshold is reached	No horseshoe crab bait fishery	No horseshoe crab bait fishery
- Daily possession limit <25 for <i>de minimis</i> state		
- HSC landing permit		
Bait Harvest Restrictions and Landings		
- ASMFC Quota	0	0
- Other Restrictions	None	None
- Landings	0	--
Monitoring Component A ₁		
- Mandatory monthly reporting	Yes (Biomedical)	Yes (Biomedical)
- Characterize commercial bait fishery	Not Applicable	Not Applicable
Monitoring Component A ₂		
- Biomedical reporting	Yes	Yes
- Required information for biomedical use of crabs	Yes	Yes
Monitoring Component A₃ Identify spawning and nursery habitat	Completed	No
Monitoring Component B₁ Coastwide benthic trawl survey	Yes, VT Trawl Survey was conducted in 2021	Yes, VT Trawl Survey will be conducted in 2022; future years and spatial scope unknown at this time
Monitoring Component B₂ Continue existing benthic sampling programs	Yes. Sampling effort reduced due to COVID-19.	Yes
Monitoring Component B₃ Implement spawning survey	Yes	Yes
Monitoring Component B₄ Tagging program	Yes	Yes

DRAFT FOR BOARD REVIEW

GEORGIA		
	2021 Compliance	2022 Management Proposal
<i>De minimis</i> status	<i>De minimis</i> status granted in 2021.	<i>De minimis</i> requested for 2022 and meets criteria.
- Ability to close fishery if <i>de minimis</i> threshold is reached	Yes	Yes
- Daily possession limit <25 for <i>de minimis</i> state	25/person; 75/vessel with 3 licensees	25/person; 75/vessel with 3 licensees
- HSC landing permit	Must have commercial shrimp, crab, or whelk license; LOA permit required	Must have commercial shrimp, crab, or whelk license; LOA permit required
Bait Harvest Restrictions and Landings		
- ASMFC Quota	29,312	29,312
(State Quota)	29,312	29,312
- Other Restrictions	None	None
- Landings	0	--
Monitoring Component A ₁		
- Mandatory monthly reporting	Yes	Yes
- Characterize commercial bait fishery	No bait landings	Yes
Monitoring Component A ₂		
- Biomedical reporting	Not Applicable	Not Applicable
- Required information for biomedical use of crabs	Not Applicable	Not Applicable
Monitoring Component A₃ Identify spawning and nursery habitat	Completed	Not Applicable
Monitoring Component B₁ Coastwide benthic trawl survey	Yes, VT Trawl Survey was conducted in 2021	Yes, VT Trawl Survey will be conducted in 2022; future years and spatial scope unknown at this time
Monitoring Component B₂ Continue existing benthic sampling programs	Yes	Yes
Monitoring Component B₃ Implement spawning survey	No	No
Monitoring Component B₄ Tagging program	No	No

DRAFT FOR BOARD REVIEW

FLORIDA		
	2021 Compliance	2022 Management Proposal
<i>De minimis</i> status	<i>De minimis</i> status granted in 2021.	<i>De minimis</i> requested for 2022 and meets criteria.
- Ability to close fishery if <i>de minimis</i> threshold is reached	Yes	Yes
- Daily possession limit <25 for <i>de minimis</i> state	25/person w/ valid saltwater products license; 100/person with marine life endorsement	25/person w/ valid saltwater products license; 100/person with marine life endorsement
- HSC landing permit	See above	See above
Bait Harvest Restrictions and Landings		
- ASMFC Quota	9,455	9,455
- Other Restrictions	Daily possession limit	Daily possession limit
- Landings	Confidential	--
Monitoring Component A ₁		
- Mandatory monthly reporting	Yes	Yes
- Characterize commercial bait fishery	No	Yes
Monitoring Component A ₂		
- Biomedical reporting	Not Applicable	Not Applicable
- Required information for biomedical use of crabs	Not Applicable	Not Applicable
Monitoring Component A₃ Identify spawning and nursery habitat	Yes	Yes
Monitoring Component B₁ Coastwide benthic trawl survey	Yes, VT Trawl Survey was conducted in 2021	Yes, VT Trawl Survey will be conducted in 2022; future years and spatial scope unknown at this time
Monitoring Component B₂ Continue existing benthic sampling programs	Yes	Yes
Monitoring Component B₃ Implement spawning survey	Yes	Yes
Monitoring Component B₄ Tagging program	No	No

Atlantic States Marine Fisheries Commission

ISFMP Policy Board

November 10, 2022

11:45 a.m. - 2:15 p.m.

Hybrid Meeting

Draft Agenda

The times listed are approximate; the order in which these items will be taken is subject to change; other items may be added as necessary.

1. Welcome/Call to Order (*S. Woodward*) 11:45 a.m.
2. Board Consent (*S. Woodward*) 11:45 a.m.
 - Approval of Agenda
 - Approval of Proceedings from August 2022
3. Public Comment 11:50 a.m.
4. Executive Committee Report (*S. Woodward*) 12:00 p.m.
5. Lunch Break 12:15 p.m.
6. Review Draft *De Minimis* Policy (*T. Kerns*) **Possible Final Action** 12:45 p.m.
7. Committee Reports 1:30 a.m.
 - Habitat (*L. Havel*) **Possible Final Action**
 - Atlantic Coastal Fish Habitat Partnership (*L. Havel*)
 - Law Enforcement (*T. Kerns*)
8. Progress Update on On-Going Stock Assessments (*K. Drew/J. Kipp*) 2:00 p.m.
 - Black Drum
 - Black Sea Bass
 - Bluefish
 - Spiny Dogfish
9. Review Noncompliance Findings (If Necessary) **Action** 2:10 p.m.
10. Other Business/Adjourn 2:15 p.m.

The meeting will be held at The Ocean Place Resort (1 Ocean Boulevard Long Branch, NJ; 732.571.4000) and via webinar; click [here](#) for details

MEETING OVERVIEW

ISFMP Policy Board
Thursday November 10, 2022
11:45 a.m. -2:15 p.m.
Hybrid Meeting

Chair: Spud Woodward (GA) Assumed Chairmanship: 10/21	Vice Chair: Joe Cimino (NJ)	Previous Board Meetings: August 4, 2022
Voting Members: ME, NH, MA, RI, CT, NY, NJ, PA, DE, MD, DC, PRFC, VA, NC, SC, GA, FL, NMFS, USFWS (19 votes)		

2. Board Consent

- Approval of Agenda
- Approval of Proceedings from August 4, 2022

3. Public Comment – At the beginning of the meeting public comment will be taken on items not on the agenda. Individuals that wish to speak at this time must sign-in at the beginning of the meeting. For agenda items that have already gone out for public hearing and/or have had a public comment period that has closed, the Board Chair may determine that additional public comment will not provide additional information. In this circumstance the Chair will not allow additional public comment on an issue. For agenda items that the public has not had a chance to provide input, the Board Chair may allow limited opportunity for comment. The Board Chair has the discretion to limit the number of speakers and/or the length of each comment.

4. Executive Committee Report (12:00-12:15 p.m.)
Background <ul style="list-style-type: none">• The Executive Committee will meet on November 9, 2022
Presentations <ul style="list-style-type: none">• S. Woodward will provide an update of the Executive Committee’s work
Board action for consideration at this meeting <ul style="list-style-type: none">• none

5. Lunch Break

6. Review Draft <i>De Minimis</i> Policy Possible Final Action (12:45-1:30 p.m.)
Background <ul style="list-style-type: none">• The Commission includes <i>de minimis</i> provisions in interstate FMPs to reduce the management burden for states that have a negligible effect on the conservation of a species. The <i>de minimis</i> provisions in FMPs vary by species and include a range of requirements for management measures, reporting requirements, and <i>de minimis</i> qualification periods.

- Past Policy Board *de minimis* discussions focused on the balance between standardization across FMPs and the flexibility for the species management boards in developing *de minimis* provisions.
- The Policy Board tasked a Work Group to provide a recommendation for addressing *de minimis* that addresses the concerns raised by the Board which were presented in May. Based on the recommendations the Board tasked staff to draft a white paper with options for a draft policy which were presented to the Board in August. The Board Provided feedback on the options and tasked staff to develop a Draft *De Minimis* Policy for Board review.

Presentations

- T. Kerns will present the Draft *De Minimus* Policy (**Supplemental Materials**)

Board action for consideration at this meeting

- **Review Draft Policy and provide feedback to staff**

7. Committee Reports (1:30-2:00 p.m.) Possible Final Action

Background

- The **Habitat Committee** will meet on November 7.
- Atlantic Coast Fish Habitat Partnership’s Steering Committee will meet November 8-10.
- The **Law Enforcement Committee** will meet on November 8.

Presentations

- L. Havel will provide and update of the Habitat Committee’s work and present the Fish Habitats of Concern Document (**Briefing Materials**)
- L. Havel will provide an update of the ACFHP’s work and provide details on the FY 2024 National Fish Habitat Partnership RFP
- T. Kerns will provide and update of the LEC’s work.

Possible Board action for consideration at this meeting

- Consider approval of the Fish Habitats of Concern Document

8. Progress Update on On-Going Stock Assessments (2:00-2:10 p.m.)

Background

- Black drum, black sea bass, bluefish and spiny dogfish are all undergoing stock assessments

Presentations

- J. Kipp and K. Drew will provide updates on the black drum, black sea bass, bluefish and spiny dogfish stock assessments

Board action for consideration at this meeting

- None

9. Review Non-Compliance Findings, if necessary Action

10. Other Business/Adjourn

**DRAFT PROCEEDINGS OF THE
ATLANTIC STATES MARINE FISHERIES COMMISSION
ISFMP POLICY BOARD**

**The Westin Crystal City
Arlington, Virginia**

August 4, 2022

These minutes are draft and subject to approval by the ISFMP Policy Board.
The Board will review the minutes during its next meeting.

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These minutes are draft and subject to approval by the ISFMP Policy Board.
The Board will review the minutes during its next meeting.

INDEX OF MOTIONS

1. **Approval of agenda** by Consent (Page 1).
2. **Approval of Proceedings from May 5, 2022** by Consent (Page 1).
3. **Move to adjourn** by Consent (Page 48).

These minutes are draft and subject to approval by the ISFMP Policy Board.
The Board will review the minutes during its next meeting.

ATTENDANCE
Board Members

Pat Keliher (AA)	Roy Miller, DE (GA)
Sen. David Miramant, ME (LA)	Craig Pugh, DE, proxy for Rep. Carson (LA)
Cheri Patterson, NH (AA)	Mike Luisi, MD, Administrative proxy
Dennis Abbott, NH, proxy for Sen. Watters (LA)	Lynn Fegley, MD, Administrative proxy
Dan McKiernan, MA (AA)	Russell Dize, MD (GA)
Raymond Kane, MA (GA)	Pat Geer, VA, proxy for J. Green (GA)
Jason McNamee, RI (AA)	Chris Batsavage, NC, proxy for K. Rawls (AA)
David Borden, RI (GA)	Jerry Mannen, NC (GA)
Eric Reid, RI, proxy for Sen. Sosnowski (LA)	Bill Gorham, NC, proxy for Rep. Steinberg (LA)
Matt Gates, CT, proxy for Justin Davis (AA)	Mel Bell, SC (AA)
Bill Hyatt, CT (GA)	Chris McDonough, SC, proxy for Sen. Cromer (LA)
Jim Gilmore, NY (AA)	Doug Haymans, GA (AA)
Emerson Hasbrouck, NY (GA)	Spud Woodward, GA (GA)
Joe Cimino, NJ (AA)	Erika Burgess, FL, proxy for J. McCawley (AA)
Tom Fote, NJ (GA)	Gary Jennings, FL (GA)
Kris Kuhn, PA, proxy for T. Schaeffer (AA)	Marty Gary, PRFC
Loren Lustig, PA (GA)	Mike Ruccio, NMFS
John Clark, DE (AA)	

(AA = Administrative Appointee; GA = Governor Appointee; LA = Legislative Appointee)

Staff

Robert Beal	Kristen Anstead	Jeff Kipp
Toni Kerns	Katie Drew	Sarah Murray
Tina Berger	Emilie Franke	Marisa Powell
Maya Drzewicki	Lisa Havel	Anna-Mai Christmas Svajdlenka
Lisa Carty	Chris Jacobs	Deke Tompkins

Guests

Max Appelman, NOAA	Mike Celestino, NJ DEP	Helen Takade Heumacher, US FWS
Pat Augustine, Coram, NY	Heather Corbett, NJ DEP	Carol Hoffman, NYS DEC
Rachel Barrales, Cape Cod Fishermen	Nicole Costa	Kyle Hoffman, SC DNR
Linda Barry, NJ DEP	Christine Densmore, USGS	Harry Hornick, MD DNR
Sharon Benjamin, NOAA	John Duane	Jesse Hornstein, NYS DEC
Alan Bianchi, NC DENR	Cynthia Ferrio, NOAA	Janelle Johnson, NC DENR
Sharon Benjamin, NOAA	James Fletcher	Adam Kenyon, VMRC
Mandy Bromilow, NOAA	Dawn Franco, GA DNR	Karen Knotts, USGS
Jeff Brust, NJ DEP	Alexa Galvan, VMRC	Kathy Knowlton, VMRC
Nicole Caudell, MD DNR	Lewis Gillingham, VMRC	Chip Lynch, NOAA
John Maniscalco, NYS DEC	Angela Giuliano, MD DNR	Shanna Madsen, VMRC
	Joshua McGilly, VMRC	Kim McKown, NYS DEC

These minutes are draft and subject to approval by the ISFMP Policy Board.
The Board will review the minutes during its next meeting.

Guests (continued)

Nichola Meserve, MA DMF
Steve Meyers
Chris Moore, CBF
Wendy Morrison, NOAA
Allison Murphy, NOAA
Virginia Olson, Lobster Local #207
Derek Orner, NOAA
Nicholas Popoff, US FWS
Will Poston, SGA

Jill Ramsey, VMRC
Jason Rock, NC DENR
Mike Ruccio, NOAA
Steven Scala
Eric Schneider, RI DEM
Amanda Small, MD DNR
Melissa Smith, ME DMR
Somers Smott, VMRC
Kevin Sullivan, NH F&G

Spencer Talmage, NOAA
Angel Willey, MD DNR
John Page Williams
Chris Wright, NOAA
Dan Zapf, NC DENR
Faith Zerbe, DE Riverkeeper
Erik Zlokovitz, MD DNR

These minutes are draft and subject to approval by the ISFMP Policy Board.
The Board will review the minutes during its next meeting.

The ISFMP Policy Board of the Atlantic States Marine Fisheries Commission convened in the Jefferson Ballroom of the Westin Crystal City Hotel, Arlington, Virginia, via hybrid meeting, in-person and webinar; Thursday, August 4, 2022, and was called to order at 9:40 a.m. by Chair A.G. “Spud” Woodward.

CALL TO ORDER

CHAIR SPUD WOODWARD: All right, I’m going to go ahead and call the meeting of the ISFMP Policy Board to order. For those of you that are virtual, this is Spud Woodward Governor’s Appointee Commissioner from the state of Georgia, and current Commission Chair. Welcome everybody to our meeting.

APPROVAL OF AGENDA

CHAIR WOODWARD: Our first order of business is approval of the agenda. Is there any request in modifications or changes to the agenda? If so, raise your hand and be recognized. I don’t see anything. Any opposition to accepting the agenda as presented? I don’t see any, so we’ll consider the agenda adopted by unanimous consent.

APPROVAL OF PROCEEDINGS

CHAIR WOODWARD: In your briefing materials we also had proceedings from our May, 2022 Policy Board meeting. Any edits, modifications, corrections to the minutes? I don’t see any. Is there any opposition to accepting those minutes and proceedings? Seeing none; we’ll consider those accepted by unanimous consent as well.

PUBLIC COMMENT

CHAIR WOODWARD: This is a time we have available for public comment. I don’t see anybody in the audience, do you have anybody online? Don’t see any hands, so no public comment.

EXECUTIVE COMMITTEE REPORT

CHAIR WOODWARD: At this point I’ll give a brief report on our Executive Committee meeting, which was held yesterday from eight to ten. After our administrative duties with the agenda and the meeting summary, we had no public comment.

Bob gave a brief CARES Act update. Things are proceeding well. We are looking at probably a significant understand of Cares 2, and so the Executive Committee will be deliberating on that in the future, as far as possibly shifting money from unspent jurisdictions to those that still have remaining needs.

We did that with Cares 1, it worked out real good. That is proceeding along. The next thing we did was received a report from the de minimis Work Group from Toni Kerns. I want to thank that group for the work they’ve done. We discussed that report quite a while, and actually came up with some recommended preferred under the options where there are option categories, and Toni will be reporting on that a little later on in our agenda. We also reviewed and updated investment policy. The way the Commission operates is it tries to maintain an adequate balance in an operating fund to cover costs associated with staffing and operations. In the past we’ve had sort of a three-tier approach. Going forward we’re going to have a two-tier approach. We’ll have an operating fund balance, and we’ll have a reserve fund.

That reserve fund will be there as a contingency. Those monies are invested in a diverse portfolio that mixes gain with low risk. Going forward, whenever we develop an annual budget, we’ll be looking at the budget and unspent funds, and how to possibly either move those funds into activities or to perhaps add them back to the reserve fund.

That was approved by the Executive Committee. Next thing we did was reviewed a letter of support for a Resilient Coast and Estuaries Act. That was brought to us by the Legislative Committee, and we approved that and later on in our agenda I’m going to ask Bill Hyatt, our Legislative Committee Chair to

bring that forward to the Policy Board for consideration.

Next, we had a presentation from Dr. Lindie Hice-Dunton. She is Executive Director of the Responsible Offshore Science Alliance. That group has come to the states from Maine to North Carolina, asking for some support. She gave an overview of that entity's activities, the kind of things they're doing, how important or relevant they are going to be.

That was an informational presentation to the Executive Committee. Then we also had a review of the latest version of the Appeals Policy, which we're calling now the zombie policy, because every time we try to get it done, it keeps rising back up again and takes on new life. Hopefully today we can actually finally put it to rest. That's another thing that we'll be dealing with a little later in the agenda.

But the Executive Committee approved the latest version of it. Under Other Business, our Awards Committee Chair, Jim Gilmore, brought up the idea that arose during the most recent committee deliberations of recognizing those folks in the states that have done a superlative job managing the Cares Act on top of their other duties. That's something the Awards Committee will be working towards.

Then lastly, we received an annual meeting update, like all of you should have seen your e-mails from Tina, but that will be November 6 through 10, 2022, at the Ocean Place Resort in Long Branch New Jersey. Tom Fote mentioned that there will be fishing opportunities, so if you do have plans on coming in early, or have the opportunity to come in early, there will be some opportunities.

Please, just factor that in your long-term planning, and get back in touch with Joe and Tom, and let them know about it so they can get a head count. That is the report from the Executive Committee. Any questions? As I said,

some of those items you'll be seeing a little later in the agenda.

CONSIDER CHANGES TO THE APPEALS POLICY

CHAIR WOODWARD: Seeing no questions, our next agenda item is the Appeals Policy, and I'm going to turn that over to Bob.

EXECUTIVE DIRECT ROBERT E. BEAL: Great, thank you, Mr. Chair. As Spud tactfully said, the goal here is to wrap this up and approve it today, hopefully. There are two changes. The most recent version of the Appeals Document was included in supplemental material. There are two changes that are highlighted in yellow, and then I have one additional change that I'll briefly comment on. But I'll talk about the two changes that were highlighted in yellow. As everyone may remember, at the May meeting we brought the Appeals Policy back to the Policy Board, and there was a suggested change during that meeting.

The change to reflect that conversation begins on Page 3 and ends on Page 4. It centers around the idea that as we move through the appeal process, if an appeal gets to this Policy Board, and this Policy Board needs some additional technical information, they can reach out to one of the technical support groups, you know a Technical Committee, Assessment Science Committee, Management Science Committee, whatever it might be, ask for additional analysis or information, and the Technical Support Group will get that together as quickly as possible.

The Policy Board will revisit the issue at the next quarterly meeting, or at an interim meeting between the two quarterly meetings. That is included there. As I said, on Page 3 or on Page 4. Then if you look on the other highlighted yellow section on the last page, Page 5, it's just a recognition that, you know as we go through the appeals process there, the management boards and Policy Board need to keep in mind that some of our FMPs are jointly managed with the Mid-Atlantic Council, in particular.

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Just reading the language very quickly, in the case of a jointly managed species, the Policy Board and the species management board should consider that corrective action could result in inconsistent measures between state and federal waters. This isn't an obligation to consult with one of the Councils, or anything along those lines.

It's just a recognition that there is this potential cascading impact across these joint FMPs, and something to keep in mind when the Policy Board and species management board is deliberating on what exactly they want to do for corrective action. The other one that I wanted to briefly comment on, it's kind of a write-in change here at the last minute is: At the end of the first paragraph on Page 4, there is a sentence.

The last sentence there that is actually in a little bit different font, so it stands out. If the Policy Board requires a management board to take specific corrective actions, the scope of potential corrective actions must be consistent with the presentation of management options provided to the public in a draft amendment or addendum.

This language was approved by the Policy Board last meeting. I think it's all set. But I think we need to add a clause in here that this only obviously applies to issues that went out for public hearings. Sometimes there is conservation equivalency or specifications setting, or other things that happen at the management board can be appealed, but they don't have a public hearing record, they don't have a range of options that went out for public hearing.

This sentence kind of shouldn't hamstring the flexibility of a board moving forward, for issues that weren't taken out to public comment. We'll add sort of that clause, so it will read, if the Policy Board requires, the management board to take specific corrective actions for issues that went out for public hearing, the

scope of potential corrective actions, etcetera. Just a note in there that that sort of limited scope only applies to issues that went out for public hearing. Those are the changes, three of them. Happy to answer any more questions or provide more background if anyone wants it.

CHAIR WOODWARD: All right, thank you, Bob. Any questions? Marty Gary.

MR. MARTIN GARY: Thank you, Bob. I think the answer is going to be yes, but I just wanted to be sure I understood it. Hypothetically, in the case of striped bass, if we were to exercise Board action come this November. Hopefully we won't, but if we do and we were to, that would be not an Addendum process with the public hearings. Would your narrative address that? My concern is that is a gray area.

EXECUTIVE DIRECTOR BEAL: The answer is yes. If the Striped Bass Board takes corrective action, because the assessment indicates that action is needed, and a state felt aggrieved by that action, a state could appeal, and obviously, as you said, there are no public comment options or a range of options wasn't taken out for public comment, since the public and the Board agreed to the fast process in Amendment 7.

CHAIR WOODWARD: Go ahead, Dan.

MR. DANIEL McKIERNAN: Bob, could you speak to the phrase, consistent with.

EXECUTIVE DIRECTOR BEAL: In the paragraph on Page 4?

MR. McKIERNAN: Yes.

EXECUTIVE DIRECTOR BEAL: That was a term that I think was debated over and over at the Executive Committee, and that's what they came up with to say, one of the options included, or there is a range of options, obviously that go out to public hearing, right? It has to be consistent with one of those options.

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Or if that document notes that those options can be hybridized, and it has to be consistent with that. Whatever language we're going to include in any draft documents now, the range of options the Boards and Policy Board have for corrective action, are going to be limited to that range that is presented at public hearing. Does that help?

MR. McKIERNAN: It does. It's not necessarily one of the discreet options, but it could be in the range of.

EXECUTIVE DIRECT BEAL: Yes.

MR. McKIERNAN: All right, thank you.

CHAIR WOODWARD: Yes, I sort of think of it as if you have A, B and D you could create a C, because it's a hybrid of B and D or something sort of like that. But it would be within the sideboards that have been discussed and debated. John Clark.

MR. JOHN CLARK: Yes, that was one of the things that I was very much in favor of adding to this. Yes, that is pretty much what I was thinking, but I also want us to be clear when we draft an amendment or an addendum, to make it clear to the public that that is a possibility, if that is a possibility. If there are discreet options to put it that way, or if they could be one from Column A, one from Column B, we make that clear when it goes out for public hearings. Thanks.

CHAIR WOODWARD: All right, any other questions about the latest draft of the Appeals Policy? Is there any opposition to accepting it in the form it has been presented? Speak now or forever hold your peace. We are ready to put the stamp of approval on this one. I don't see any opposition, so we will consider it approved by unanimous consent. Thank you, very much. Okay, we put the Zombie in the ground and got enough dirt on it, hopefully to hold it down.

We'll see next time we have to use it, which I hope is way beyond my tenure as Chair. Hopefully.

REPORT FROM THE *DE MINIMIS* WORKGROUP

CHAIR WOODWARD: Our next item is the report from the De Minimis Workgroup, and I've said, the Executive Committee discussed this quite a bit yesterday, and came up with some preferred options. They certainly are not binding on the Policy Board, but I think they are the result of a good dialogue and a good discussion and input. I'll turn it over to Toni.

MS. TONI KERNS: Thank you, Mr. Chairman. In your supplemental materials is a draft of a De Minimis white paper. The first bit of the draft just outlines the definition of de minimis, and the provision that allows for de minimis within the ISFMP charter for each of the species FMPs. The draft Policy outlines a set of standards that we could use for each of our species FMPs.

It does state that species boards could deviate from the standards, to address unique characteristics of a fishery. But those species boards must provide a rationale for why it is deviating from those. Then the draft also notes that federal FMPs do not recognize de minimis standards, therefore any de minimis measures implemented in a Commission FMP for jointly managed species, could result in inconsistent measures between state and federal waters.

Sometimes this gets a little tricky for evaluating compliance for states, when doing that in conjunction with the fishery management councils, in addition, sometimes it becomes confusing for fishermen who fish in state and federal waters, but have a federal permit. But the policy does not state what we need to do with that if the Policy Board has specific direction, then I can put that into the draft Policy.

For the minimum standards section, each FMP would establish a set of minimum standards for de minimis states. It would provide a minimum level of conservation for that species, and those minimum

standards would also prevent any regulatory loopholes for that fishery. The measures for the commercial and recreational fishery could be the same, or you could have minimum standards for each of those species.

For the sections that have options, I have highlighted in blue the preferred option from the Executive Committee. This is thinking about how we designate the fishery, meaning how do we apply de minimis to the commercial and recreational fishery. The first option is to allow each species board to review the provisions, and determine how de minimis would be considered on their own. It would either be commercial and recreational together, they could be separate, or you could have it just for one of the sectors. Option 2, which is the preferred option, is to separate for commercial and recreational sectors, or you could allow it just for one of the sectors. The last option 3 is a provision to have the commercial and recreational combined. Next is looking at the thresholds, so how do you establish de minimis? The first part of it, is whether or not you average landings.

This is suggesting we average landings, but for how long? Thresholds would be based on the average landings of the previous X number of years. Option 1 is two years, and the preferred option from the Executive Committee would be three years. This was suggested because it allows to sort of not chase the noise in fisheries, and not make you have to react back and forth to maybe a blip in a fishery change.

It really allows for consistent, either increase in landings or consistent decrease in landings for a state to be either in or out of de minimis. Next is what percentage of the coastwide landings would allow you to be de minimis. Option 1 is to task each of the species' boards TCs to determine what is an appropriate level that would have a negligible effect on conservation.

Option 2, which is the preferred option, is that a state's landings be less than 1 percent of the

coastwide landings, and Option 3 is to be less than half a percent of the coastwide landings. I think that mostly the less than 1 percent is just somewhat consistent with what we have for most of our species.

I recognize that there are some species that have a different percentage, and as I said before, a species board could consider something different if they have some unique characteristics. Then lastly is looking at sampling requirements. De minimis states can be exempt from sampling requirements. It's important to note that biological samples for the outer edge states could be pretty important for stock assessments.

In particular, for all of the states for data poor species, those samples might be important. It is recommended that the species boards have the Stock Assessment Subcommittee or TC review sampling requirements for de minimis states, to determine an appropriate level, if any are important at all. The intent today is to get direction from the Policy Board on which options to move forward with, and then I would go back and complete the white paper and bring it back to the Policy Board for approval in November.

Then as species boards make changes to their FMPs, either through addendum or amendments, then we can address any changes that they need to make in their de minimis plans. It would be up to a species board and their prerogative if they want to take action just on de minimis they could do so.

I mean we can work that into the Action Plan for future years. The other part that I said that I would work into the white paper is just to note the importance of paying attention to the stock status, and how at times if you were overfished and overfishing was occurring, or if you were in a rebuilding program that Technical Committees may need to take a look at the minimum standard measures, or some of the sampling requirements for that species, to make sure that it is still having a negligible impact, or that we're collecting enough information for those species specimens to carry forward when they are in a declining state. It also

may impact the percent that allows a state to be de minimis, because if you have super low levels of catch, 1 percent maybe close to what most states were already catching.

CHAIR WOODWARD: All right, thanks, Toni, and let me I guess maybe put a little context on what I see is the practical application of this. That is, say for instance that we adopted those preferred options as the standards. They would be sort of the first filter that a management board and its supporting technical committees would use to apply an analysis of the appropriateness and efficacy of de minimis.

It may be that those entities decide that de minimis is not appropriate, because of the unique characteristics of that fishery or that species. They may decide that it needs to be less than 1 percent or you know you may have de minimis for recreational but not for commercial. But it would be the first thing that you would apply to that analysis.

That would bring some level of standardization, because if you look at the supporting table for it, it's pretty much all over the place. I mean we have some plans with no de minimis, we have lobster with a specified amount, it's not a percentage. In some we have you know a tenth of a percent, some we have a percent.

This would encourage at least the application of a standard when you're doing the analysis. That is sort of the way that I see this working. It isn't going to bind a Board or its Technical Committees to a specific set of parameters, but it applies a uniform sort of filter to everything. That is kind of what I see as this being a practical application. Doug, you had your hand raised?

MR. DOUG HAYMANS: Thank you, Toni, could you go back to the fishery designation slide, please? This may be a benefit of being back in person meetings, or it could be a detriment. But you know, you have a chance to talk about this over dinner. Several of us were

questioning. I guess I'll take the credit. We were questioning the wording and whether it got to where we thought it should be. At least for me, in initiating this request, I was looking to require each species board to have de minimis for recreational, commercial, and/or both.

Of the three options that are there, as they're written. I don't know that there is a requirement for each species board to have de minimis. You know once there is de minimis within the Board, then the Board can choose whether or not it grants de minimis to a state that has to provide justification why it can't grant de minimis. But without having that provision there, the state doesn't even have an opportunity to request de minimis. I don't see the option there.

For me, Option 2, if it were to drop the "or for only one sector" and instead say "or both fisheries together" or "both fisheries combined" the way that 3 reads. To me that would do it. De minimis for all plans is either considered separately for commercial and recreational or together, or combined. If that is what we selected, then each species board would be required to have de minimis for each sector. I just don't know that either of those three get us there.

CHAIR WOODWARD: Thank you, Doug, anyone else have similar concerns? Erika.

MS. ERIKA BURGESS: I hate raising my hand to speak, just to say the same thing someone else said, so I'll say that I also support what Doug said.

CHAIR WOODWARD: Okay. What you're recommending, Doug, is that we basically say, change Option 2, provision is separate for commercial and recreational or.

MR. HAYMANS: Combined.

CHAIR WOODWARD: I guess we need to remove the word separate, you could say provision is for commercial or recreational or combined, because you really can't have them separate and combined, that would kind of cancel each other out.

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MR. HAYMANS: Well, the idea to me at least, would be that the species board would have to have a provision for both sectors, whether they are separate or combined could be up to the species board, but they at least have to have provisions for each sector.

CHAIR WOODWARD: Okay, Toni is going to look into the charter, to make sure we're not getting crossways with something. Anyone feel like that's the wrong path to go down to make that modification? Again, this is setting sort of a standard. The first thing that a Board has to do to address the concept of de minimis, and then they move forward making decisions based on the uniqueness of that fishery and that species going forward. Roy.

MR. ROY W. MILLER: Mr. Chairman, with regard to Doug's suggestion. How about a fishery like menhaden, where there is not recreational de minimis component? I assume that is what the framers of this were thinking when they put or for just one in there. What I'm getting at, you can have separate commercial and/or recreational de minimis definitions. But in some cases, there may only be a recreational or a commercial de minimis.

CHAIR WOODWARD: Right, and I think what he's suggesting would allow for that. That Board would analyze that fishery based on its attributes, and then make the decisions. Obviously if there is not a recreational component it would be no point to develop a recreational de minimis. But where you've got mixed use fisheries, you know it's sort of saying, hey you need to at least discuss and attempt to establish these things separate, unless there is a compelling reason why you're not going to do it differently. Mel, you raised your hand?

MR. MEL BELL: Yes, I think it's just kind of the semantics here. If I'm following this, it could say, provision is for commercial and recreational combined, or for just one, and that gives you your options, combined, or if there is

no recreational one, it's one or the other. Is that kind of what you were going?

MR. HAYMANS: Well, to me the phrase "or for just one" allows a species board to only do one. If there is justification, menhaden, and it's written in that there is no recreational de minimis because there is no recreational fishery. That makes sense. But again, we go back to bluefish. There is not a recreational de minimis, but yet there are recreational fisheries throughout. I'm simply trying to ask the Bluefish Board and the other boards where it may come up, to consider recreational de minimis. I'm just trying to get that into each plan across the board.

CHAIR WOODWARD: All right, Jay.

DR. JASON McNAMEE: I'm not disagreeing here. I thought I would just offer another angle on this. I'm having a little difficulty understanding how you might combine them, so maybe it's happening somewhere and I've not seen that yet. But the notion of having them separate, in my mind makes sense, because the data streams are so different. Even in the case of menhaden you could calculate.

There are recreational harvests, so you could figure out whether or not you are de minimis, based on the recreational harvest of menhaden in your state. I'm not suggesting we do that. It could be done. But that is kind of what I'm getting at is, you know normally for a commercial fishery you have some sort of a quota, a census type accounting system. For recreational you have MRIP. I guess what I'll say is combining those two things together is not an insignificant task. You would have to really think it through.

CHAIR WOODWARD: Maybe this will help clarify a little bit too. Really what we're talking about here is where we have both, those landings are combined together to generate a number that is then used to compare to the coastwide landings. We use a combination of recreational estimates of recreational landings, and reported commercial landings for spot, spotted sea trout, striped bass, weakfish.

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What Doug is saying is that you analyze them and develop separate criteria, and if you applied that like we do in, I guess some fisheries, you would have an estimate of recreational landings, and you use that number to compare to the estimate of coastwide recreational landings. You have a reported commercial landing for a jurisdiction, and you compare that to the coastwide landings.

You might be one, you might qualify for both, you might qualify for one and not the other. I'm capturing sort of where we're going with this. The intent, I think, is to, I hate to use the word compel, but to get each management board to at least do the initial analysis where appropriate, to have separate criteria for the two fisheries.

You know we talked about the challenges of using MRIP estimates for recreational, and the fact that they can be erratic. You know and you can run into situations where you're in one year and out the next year, because of the vagaries of the way MRIP estimates go. Maybe if we tweak this a little bit.

Again, we're not looking to make final approval of this, tweak that language. If everybody is agreeable with the intent of what we're trying to accomplish with that language, I think we can perfect it maybe, to make sure that it communicates clearly what the intent of that language is. Then when we come back at the annual meeting, make sure. It's kind of like the Appeals Policy. You know the turn of a phrase or the meaning of a word makes a big difference. We want to make sure that everybody is comfortable with where that language takes us.

MS. KERNS: Spud, I think that the charter itself is specifying, and I'm not quite sure if I think it requires de minimis. But I think that that is where the charter is what gets at whether or not you require it or not. That may be, and I'll come back to the workgroup and let you know. Maybe where you require it.

Then this language that we're talking about tweaking is just whether or not when you are evaluating your de minimis. Are you doing it with the two sectors combined, or are you separating them and then determining it? I guess if you don't have de minimis for one of your sectors, then you are not evaluating it, so it is automatically by itself.

CHAIR WOODWARD: Are we generally comfortable that we've got something to work from to come back with? Eric nodded his head, thank you. You look pretty somber over there. As far as the other options go, are we comfortable with those other options again? You know you had set the 1 percent standard, but that doesn't mean a management board could not deviate from that. But it has to have a clear rationale for why it would deviate from that 1 percent.

It just puts a little more onus back on the boards and the supporting scientific bodies. You know it's kind of like what John was talking about. You know make sure we clearly articulate in our documents what the outcomes could be, or why an outcome is what it is. I mean if folks are comfortable.

We can work on that and come back at the annual meeting and have a chance to chew on it a little more. Is everybody okay with that at this point? Generally seeing heads nodding, all right, thumbs up from Eric, all right, very good. Okay, thank you all.

UPDATE ON EAST COAST CLIMATE CHANGE SCENARIO PLANNING

CHAIR WOODWARD: We'll move on, and Ms. Kerns, you're back on stage for East Coast Climate Change Scenario Planning.

MS. KERNS: Thank you, Mr. Chairman. Just as a very quick reminder, this is East Coast Scenario Planning, and it is addressing how the East Coast management bodies are going to address governance and management issues that are being affected by climate change, and particularly looking at stock availability and distributions.

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We are hoping to advance a set of tools and processes that can provide flexible and robust fishery management strategies, to continue to promote fishery conservation and resilient fishing communities, and address uncertainty in an era of climate change. Where we are in this process, we just finished the scenarios itself, so looking at what will our future look like.

I will go briefly over those scenarios today, and we are moving into the application phase. This is using the scenarios to identify actions and recommendations for how we make adjustments to our management process, so we can be more flexible in the future. A couple of things that are coming up, in terms of our timeline.

We'll be hosting Scenario Deepening webinars this month, August 17 and August 23. The webinars are open to all stakeholders to validate the scenarios that we created. We'll give an overview of the stories from these initial scenarios, and allow participants to have the opportunity to give us comments and make suggestions on the scenarios, on how to make them more plausible, challenging, relevant, memorable and divergent. Then next we've added something new to our process. We are going to do some fishery manager brainstorming workgroups in September. The purpose of these is to help identify the issues, ideas and options that should be discussed at Scenario Planning conversations that we're going to have at all three councils and the Commission meetings during the fall.

Then those ideas would be presented at the Summit meeting in early '23. The output from these working sessions will ensure that the Council and Commissions won't be starting from a blank slate at our meetings this fall, but have specific issues to consider and ideas to build on, setting the stage for the summit.

We will be reaching out to folks to see if anybody is interested in participating in these working groups. We're going to have three

meetings sometimes in September, and it will be intermingling of Council and Commission, and some NOAA/GARFO staff, and Science Center staff. Then lastly, we'll have the Summit meeting in February.

It will serve as the venue to discuss inputs from the manager meetings in the fall, with the goal of developing a final set of governance management and monitoring requirements for the process. Most of these recommendations are likely to require further development and discussion by the NRCC, and individual management groups to address.

But we're hoping to have a final report after this Summit. The following slides that I'm going to go over outline the four scenarios that were developed in the June workshop. The scenarios are not predictions, instead they are an outline of what might happen to ocean conditions and stocks, and other changes to coastal communities.

The scenarios contain storylines and suggestions on how fishing industry participants, managers, and other players might adapt, react to, and prepare for such conditions. The purpose of these scenarios is to act as the platform for conversations on preparing for climate change. What you'll see, what I'm presenting is sort of two framework structures.

It looks at two critical uncertainties. These are important factors that will likely shape our future, but could develop in unpredictable ways. The Y axis, which I know this doesn't look like a Y axis, but it doesn't fit on the slide, is stock production replacement in 2024, and it's either declining or maintained.

Next slide is the X axis, how unpredictable are our ocean conditions, and how well does science able to assess and predict stock levels by 2040. On one end of the spectrum, we could have very unpredictable changes, and conditions could be low, and ability to assess is poor, or we could have very predictable changes, conditions would be high, and our ability to assess would be good.

The framework that we built here, you'll just see in the different quadrants, starting in the upper left

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hand side stocks are maintained, but hard to assess. On the right-side stocks are maintained but are really straightforward. Bottom left stocks decline and are hard to assess, bottom right stocks decline, very straightforward and easy to assess. The story that we created, and I will go over this more thoroughly in November at our meeting. But in our upper left quadrant we have our Ocean Pioneers, where the stocks are maintained, but they are hard to assess and predict. In this time, we have crazy ocean conditions, a lot of swinging, booms and busts. The weather is weird, but the ocean is resilient. We don't have any damaging tipping points. We can have dangerous fishing conditions though, but the payoff is still there for many operators, and you can still make some money.

The traditional stock assessments are less reliable. Seasons, locations and genetic diversity have changed considerably. We have real-time data from fishery operators, it becomes more valuable than traditional science. The ocean activity is dominated by entrepreneurs, technology folks and pioneers. Winners will have deep pockets, new technology and willingness to take risks.

The balance of power in fishery is shifting towards the larger operators. They expect more help from managers as traditional science is not delivering them information. Kind of how long can abundant stocks keep delivering for those big operators? Moving down to our bottom left. We are calling this the Stress Fractures, it's where stocks are declining and are hard to assess.

We have very unpredictable conditions that create climate tipping points. Storms create pollution and reduce quality habitat. We have a lot of disease; marine heat waves lead to die-offs. There is high stress on fishing operators, stock assessments are challenged by insufficient data, and the science is unable to help the fishery management community adapt.

Cost of fishing gets very high, so profits begin to sink. The government support needed to save domestic fishery, but only a select number of fisheries can get the support. Stocks experiencing range shifts are incorrectly classified as overfished, and these false flags undermine the management process.

Fishing no longer is a dominant activity in the ocean competing with other industries for space and labor. This is kind of a gloom and doom corner. Then moving over to the bottom right, we're calling this the Managing Decline. Science is good, but the news is still bad. We have warming trends with declining productivity.

The maximum fish size is smaller, the cold pool breaks down. We have range shifts as species move north and east, but not much range expansion. The science is effective and predictive, but its findings are not always great news. Agriculture becomes very prevalent as a source for seafood, and we have effective management puts limits on newly arriving species, allowing for the establishment of reproducing populations as they move into different areas.

Therefore, we have successful small-scale fishermen that can adapt to some reduced catch in limits, and these new stocks that are coming into their area. We have unsuccessful regions have not protected newly arriving stocks, resulting in an industrialization of the fleet, and competition from imports and aquaculture.

We have on the upper right-hand corner is Checks and Balances. In this we have predictable changes and tolerable conditions. The range expansion, as many stocks move predictably north and east, advances in habitat protection and climate mitigation are good for fishing in coastal communities. Disease is only apparent in a limited number of stocks. Science effectiveness improves, and is delivering effective ocean monitoring, real-time fisheries are reporting in through web, and population monitoring is going well. Carbon emission growth has been limited, and pollution is under control. The species composition has

changed, but management can provide a full and flexible balanced use of the fish stocks.

There is investment in other ocean uses and coastal uses that provide economic bounty to coastal communities, and the recreational sector is healthy, thanks to stable productivity and increased coastal wealth. That is our like super positive corner. As we move forward, we'll provide more information for these different scenarios that are presented here.

What we're asking for management bodies to do is think about, okay if we move to any of these corners, how do we really need to be more adaptable and flexible in our management process, in order to travel down one of these paths? It's not necessarily that we want to know how we change specific measures for this particular species.

But it's how does our process work, how do we interact with other states, how do we interact with the fishery management councils to make these changes. Thinking about big picture, switches, or maybe some stuff still works and we don't have to make those changes. That's all I have.

CHAIR WOODWARD: Well, after that cheerful presentation. I think we'll just end the meeting there, and we'll just go on home and enjoy what time we have left. Woo, anyway, seriously. We've got time, I don't want to give you short shrift. I figure maybe you're going to put a positive spin on this at the end. I don't want to miss that slide. Okay, all right. I saw several hands. Let's see, I've got Dan, Jim Gilmore, Tom Fote. Loren. All right, go ahead, Dan.

MR. MCKIERNAN: Toni, do you think that there is appetite to try to amend laws?

MS. KERNS: We've talked about it as a core team is that that is something that might need to happen, or that we at least identify. If we want to be able to prepare for the future, these

laws need to be changed, to allow for X, Y, or Z. It can be a recommendation that comes out of the group. Whether or not the appetite is there is hard to predict.

CHAIR WOODWARD: All right, Jim Gilmore.

MR. JAMES J. GILMORE, JR.: Toni, and that was great. I'm serious. That was very, very, very well done. It really kind of, as much as Spud said it was depressing, and it really does kind of show a big picture of what is going on. That is actually following up what Dan just said. I think for, like I said in ASMFC managed species, this is great.

But then we get to our jointly managed species, and the examples we've had the last couple of years, where I think the Commission could have fixed some things, like maybe a species like black sea bass. But it's a joint species, and Magnuson says no, so that is the end of the story. If we want to fix it, it's going to take us probably one to two years, because of the federal process. Same thing, it's like we really, a big part of this moving forward is that Magnuson has not had a major update since 2007. We didn't really have climate change when they were writing that version. You know the whole thing is about allocation, governance. All that stuff was really not a major issue. You know if we're going to move forward on this, that is an important thing to get fixed.

Granted, Bob said it yesterday. Nothing is happening on Magnuson this year, and it's been going like that for several years now. Well, we're just going to be in this endless loop of, well, Magnuson says no, so we can't do anything about it. Just as a recommendation, I think we need to be a little bit more broad than just bringing GARFO in on this.

I think at some point Headquarters really needs to come into this. We are all going to all be meeting in San Diego in November, or whatever. I'm not sure if this is ready for primetime, but we really need to start having those discussions, and even the suggestion about maybe some of the key federal

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government elected folks, their staff to be involved with this.

Because when we get to the end of this, if we've got this great document that says here is how we fix it. Then we go, well, but Magnuson says no, so we're just going to be spinning our wheels. Just some suggestions, and an important thing to do. But we've really got to look at the end game of, when we get to the end of it, are we going to have any impact? Thanks.

CHAIR WOODWARD: Yes, Toni has got a response to that.

MS. KERNS: Jim, just don't forget that this isn't just GARFO sits. We're doing this with all three management councils, GARFO, the Science Center, Headquarter staff, the Southeast Region. We have all entities involved. In addition to that, NOAA Headquarters did present a Climate Governance Strategy that they are initiating.

We are hoping that they will use the recommendations that come out of this Scenario Planning process, to help guide their policy. I do see that Mike Ruccio has his hand up on the webinar. Spud, if he wants to, I'm not sure if that is what he would be getting at, but Mike, I've unmuted you, you just have to unmute yourself.

MR. MICHAEL RUCCIO: Okay thanks, hope everybody can hear me, and apologies for not being there in person. We had a little Covid on our vacation last week. Better to spare you all from exposure. But you know Toni really stole most of my thunder, why I shot my hand up. You know Jim and Dan; I appreciate your comments.

This is something that we are both involved with, the actual scenario planning for the Atlantic Coast, and engaged with kind of on a national and broad scoping scale. We are continuing to think about and have a number of

kind of efforts, Toni mentioned one being looking at governance. We are trying to not get in the way of Scenario Planning, and see what they kind of come up with for governance recommendations.

But also, cognizant that governance can be really tricky and difficult to navigate, and if we need to kind of stand behind the process, and provide additional guidance, we're ready and poised to do that. But we have a number of efforts, I guess I would say, that are underway that are looking at shifting distribution, changes in climate, and really to the key point that I think you were raising, Jim. Does Magnuson play well in that sandbox or not? You know we have limits, in terms of what we can do and how we can influence things like reauthorization, but we've had, you know, we may have seen Janet last year up on the hill when we had the Huffman field hearing.

We've had continual conversations with a number of our authorizing committees, in both the Senate and House side. This is something that we're actively engaged in, both public facing and behind the scenes, and you know happy to have more conversation about it, if that is helpful.

CHAIR WOODWARD: Thank you, Mike. All right, Tom Fote.

MR. THOMAS P. FOTE: Yes, I've got two points, one after listening to Jim, and listening to him on the phone. I'm thinking that maybe the annual meeting would be a good time to invite some legislators in to have a workshop during one of those particular times. I know Congressman Pallone wants to come over, because he's going to give us a greeting.

But, wouldn't it be better if we basically sat around and talked about this and the Magnuson Stevens Act, and where we were? If that is what you presumed, I will try and set that up. But yes, and get one of our Senators or anybody else that would like to send staff. You know it might be an opportunity if we do something like that. That was my first point.

The second point is, I've just gone through a three-year process with Rutgers University and DEP, mapping the state of New Jersey, so what do we do with aquaculture, and where were the areas that might possibly use as the water rises in New Jersey. Spent a lot of time, a lot of money. But the amazing stuff is the USGS, all the information that we put in there.

You can put 60 overlays on these maps now, the state of New Jersey. I mean Joe could probably talk about it a little more than I, but I have been through the process. It's out in draft form, but that's what I could imagine what most states are beginning to look at. Where are the fishing areas. I'm talking about it at MAFAC, because I sit on their climate change committee, but it's really all state waters that I'm talking about mostly.

But it does give some parts to the federal waters, where the fishing grounds are. But it is interesting to look as the water rises, what are we going to lose? Where we actually can move docks to, where we're going to have aquaculture beds. We could share that with the Commission, it's still in draft form, but we're back completing that. Joe, do you have anything to follow up on that?

MR. JOE CIMINO: No, I don't have anything.

MR. FOTE: Yes, it was a lot of work, and really, I'm going to thank a lot of people for doing that. If you want, I will get involved in this committee that you are basically putting together.

CHAIR WOODWARD: I think that would be a good prompt for Toni to maybe talk about what we're going to do at the annual meeting, in regards to Scenario Planning.

MS. KERNS: Tom, I don't know if we would have time for such a workshop at the annual meeting. But, at the annual meeting we will be, as a Commission, sitting down and talking about what types of recommendations do we think are needed to change our governance, and that

is our governance, Council, NOAA. What do we think needs to change, in order to respond to any of these future scenarios?

It might be something that you want to invite them to, to listen to, but we will be spending a fair amount of time together, discussing and bringing forward recommendations that we can then take to the Summit meeting, where all of the bodies will get together, and try to bring something forward. We will have some seed ideas that come out of these brainstorming sessions that we're going to do, with the different folks from all of the bodies involved.

CHAIR WOODWARD: All right, thanks. All right, Loren.

MR. LOREN W. LUSTIG: Thank you, Toni, for a very interesting and informative report. You certainly used correctly the terms gloom and doom. In speaking of the managing the decline. You did bring out the concept of aquaculture. I would be interested in learning a lot more about aquaculture, and probabilities for ramping up those processes, as they become more sophisticated, increased efficiency, expanding. But I would wonder, is that only going to provide a tiny fraction of what the public has been used to, in terms of the availability of seafood for consumption? Even under the best scenarios, it's still just a very tiny fraction.

CHAIR WOODWARD: Yes, that's a big subject, and I think we all know there is some potential, but obviously the species diversity that is put on the tables of America would change drastically, if we had to shift over to aquaculture-based. I mean just personally; it wasn't too long ago I was skeptical that anybody would eat tilapia.

Now, you can go to just about any restaurant, and you see tilapia on the menu. But that's not necessarily a substitute for red snapper, but it is what it is. That's a big subject, and you know perhaps in one of our future meetings that is something we could delve a little deeper into, you know for the benefit of the Commission. Eric.

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MR. ERIC REID: You should pick a different restaurant, in my opinion. That's the first thing. I'm not really sure where to start. This is a big topic. But I'll start with saying that the Scenario Planning workshop was two days or three days, it was held up the street. Jonathan Star was the facilitator. He did a fabulous job. There were 70 something people in that room, and he really did a great job, so he should be absolutely commended.

You know it's interesting that the scenarios are not all doom and gloom, but that's what they heard was all doom and gloom. Well, depending on how you want to spin that compass, so you can have a lot of them. My concern is, I've got a lot of concerns, and I don't want to have a half-full glass, but you know we might as well talk about it.

One is, when we had the CCC meeting in May, was it in May? I don't remember when it was. Anyway, the Commission is not in on that. But that is when the Feds rolled out their idea about this Scenario Planning. They have their own effort that, no offense, Mr. Ruccio, my friend, Mike. But I am not sure if those efforts are running in parallel, or they are going to intersect at some point. That is unclear to me. We really didn't know a lot about that development of the Feds idea, until it was rolled out in front of the CCC. I don't think people were all that thrilled about it. You have these two things happening at once, and I am not sure if the goal for each is the same. That is the first thing.

We have to consider that. The second thing is the timing of this, in my mind, the timeline not the timing. The timing is fine. But the timeline is really, I think, that is pie in the sky. I mean we have our meeting; New England has our meeting in September, the end of September, and we have to put this on our agenda.

But we've got a lot going on in that meeting. We might be able to squeeze an hour and a half to talk about it, and then our next meeting isn't

until December. The effective input of our Council on this is not going to be that great, because when Toni did her presentation, which you did a great job, Toni.

I'm looking around the room, and people are going, what the hell am I looking at here? My Council is going to have a lot of questions, and they're going to want to talk about it, but an hour and a half isn't going to cut it. But that is all we have. That's the reality of it. You know Bob, you were in the Scenario Planning. I don't know how much staff time you have for this.

New England, you know our staff is busy. This new, The Management Working Group. I mean I don't know where it's going to all fit in, and to get this done by February. I think that is extremely ambitious. Fast is usually the opposite of good, so I think that we really have to look at what input you want. Do you want it fast, okay fine, but it's not going to be good. That's my opinion.

But it's really at this point, this is theoretical fisheries management that is going to be applied in a very near future, and that worries me. The Feds are concerned about how to change management governance on species that shift. We of course have different stakeholders that we have to be accountable to, and we have to take our time and do a good job.

Bob, I don't know if you want to speak to what your staff time looks like. You know certainly I'm not the Executive Director of New England, but I've got a pretty good idea what our timeline looks like, and it is not going to meet what has been presented today. I would rather do good than fast. That's my opinion.

EXECUTIVE DIRECTOR BEAL: Great, thanks for the invitation, Eric. You know this came along at a great time, because Toni was sitting around, really didn't have anything to do, so I gave her something to do. It worked out pretty well for us. But no. Yes, everybody is flat out busy, you know and as Toni mentioned a minute ago, or alluded to.

You know our annual meeting first week in November, you know looking at that agenda, there are some pretty big things on there. You know horseshoe crab that came out yesterday and menhaden. Those are all going to take a lot of time. Responding to getting a striped bass stock assessment and others. We're not going to have a half day or a full day to set aside and have this conversation, that I think is needed, to really dig into this and figure out collectively. Among 15 states, where do you want to go? What feedback do you want to give on the interactions with the Councils? It's complicated. If it was easy, we would have done it a long time ago. Yes, I think we're in the same spot. It's busy, it's an ambitious schedule.

But we'll, you know I think keep pushing is important. We're in a spot where, you know you mentioned the two tracks that are going on, the federal activities on governance policy and this Scenario Planning. The part I don't know is kind of how we fit into that federal process. We're the Commission, right, so we're kind of out on our own.

ASMFC chiming in on Magnuson Stevens potential changes is a little bit awkward. It doesn't really guide what ASMFC does, but indirectly it does. There are a lot of pieces here that need to be worked through. I'm not sure exactly where we find all the time to do it.

CHAIR WOODWARD: Yes, I appreciate your comments, Eric. When this first was even conceptualized, I was thinking, wow! I mean it is an ambitious undertaking, trying to look into our future that none of us can see into. But trying to make plans for that. As far as our role. I mean as Bob said, we obviously have a vested interest in what happens.

I have to frequently remind folks; nobody lives in the EEZ. They live in our states. They look to states to represent their interests. We're a good body to do that. We have a member of the public who has been very patient, and had their hand up. I'm going to, at this time, use my

discretion to afford him a couple of minutes for a comment. Then we will move on to Dr. Jon Hare for our next agenda item.

MS. KERNS: Jim Fletcher. I've unmuted you on my end, you just need to unmute yourself.

MR. JAMES FLETCHER: I found it interesting sitting here. We talk about aquaculture in the last few minutes, and yet the federal government does not have an aquaculture plan. In North Carolina we tried to put aquaculture in the EEZ. Coast Guard, Corps of Engineers, everything was used to stop it.

They didn't have a policy, but they stopped it. Now, on menhaden, no one mentioned the hybrid menhaden, and do we have the ability to do stock enhancement, to raise and release breed eggs, from there up? Every one of these species, I hear them talk about science, but we are not doing anything to enhance the species for the last 20 years.

We have ignored the science of BOFFFF, which stands for big old fat fecund female fish. If the models the staff is using were correct, they should have pointed out that we should have been leaving the largest fish. The United National Fishermen's Association has argued for God knows how long, to stop killing the large summer flounder, the females.

Yet ASMFC and the Council, has managed for the prestigious elite, and the prestigious elite is sitting around the table, are those that can afford a 20-to-30-foot vessel and a pickup truck to buy it, or private property to put the boat behind, so that they don't have to report. ASMFC has the chance to recommend cell phone reporting, so we don't have to say, oh we don't have the data. My question is, and it's very simple. Are we managing fish for food, or are we managing fish for sport?

CHAIR WOODARD: All right, Mr. Fletcher, thank you. I appreciate your comment. We need to move along. Thank you for that comment. We appreciate it. Yes.

MR. PATRICK C. KELIHER: As I've sat here and listened to the comments around the issues of

Scenario Planning and climate, and the timing issues that Eric Reid brought up. It may behoove the Executive Committee to talk a little bit about this, and even consider maybe a day for the Commission in a special meeting to talk more about this.

Because these issues of changing laws, the governance components of this, all impact the work that we're going to do here. It may be worth, especially considering the timeframes that they're talking about, rolling up our sleeves and having a broad conversation about it.

CHAIR WOODWARD: Do you want to host that up in Maine for us, some beautiful island somewhere?

MR. KELIHER: I do have an island. I'm not sure all of us would fit.

CHAIR WOODWARD: Good idea, and it is certainly something. It is not something we need to give short shrift, and I think that is the challenge is we're like jugglers that are really good, but even the best juggler in the world can only juggle so many balls at a time, and we're always pushing the boundaries.

REVIEW OF NOAA FISHERIES CLIMATE ECOSYSTEM FISHERIES INITIATIVE

CHAIR WOODWARD: With that I'm going to go into our next agenda item, and call on Dr. Jon Hare to do a review of NOAA Fisheries Climate Ecosystem Fisheries Initiative. Thank you, Dr. Hare, welcome!

DR. JON HARE: Thank you very much, and it's good to be here. When I introduced the Climate Ecosystem and Fisheries Initiative, but I'm glad I have the opportunity to follow Toni, because you just heard about Climate Scenario Planning, and part of those scenarios is sort of the decrease in the effectiveness of science to inform decision making.

That is what we, sort of NOAA Fisheries science, NOAA science in general have been working hard to sort of counter that. Our goal is to improve the science that we can provide to you, to help you make the decisions you need to make. That is where this Climate Ecosystem and Fisheries Initiative really came out of, was this interest and intent in NOAA improving the science that we make available to you.

Again, Climate Ecosystem and Fisheries Initiative, the vision is building the decision support system needed for a climate resilient fisheries ecosystems and coastal communities. You can think about this as climate models to science advice to decision makers. I'm just going to step through a little bit of detail about it, just so you are aware that we are working to improve our science.

What is the Climate Ecosystem and Fisheries Initiative? It's a cross-NOAA effort to provide climate informed advice, to reduce risks and increase resilience of marine resources, and the many people and businesses that depend on them. Cross-NOAA, it's the Oceanic and Atmospheric Research part of NOAA, which is the climate modeling part. It's NOAA Fisheries, which I think many of you know well. It's also the National Ocean Service, who are working together to try to develop this Climate Ecosystem and Fisheries Initiative.

What are we going to do? How are we going to do this? Our intent is to build end-to-end ocean decision support system, using expertise across NOAA and management partners, including Atlantic States Marine Fisheries Commission, to provide robust predictions, forecasts and projections of future marine ecosystems, including human dimensions, how humans intersect and use those ecosystems.

We very much view this as a scientific initiative, which is going to improve your ability to make decisions, so users of Atlantic States Marine Fisheries Commission are an integral part of this initiative. The intent is to inform existing management pathways that include the Marine Fisheries Commissions, Regional Offices within

NOAA, the Fisheries Management Councils, Marine Sanctuaries, among others.

This is a complicated figure. Just think of it more as conceptual. We view three intersecting parts of this initiative. On the left is the development of science research modeling observations. The middle is developing the operational capacity to provide that science, so operational climate models using standard data formats, and sort of an open information hub, where anyone can go and get climate model output.

Then on the right side is the engagement and extension, where we are working actively with you, with other management partners to use this operational science, climate informed operational science. Just to give you like a little more tangible idea, Oceanic and Atmospheric Research, the climate modeling part of NOAA, has already developed regional climate model grids.

They've developed a West Coast Regional Climate model, an Arctic Regional Climate model, an East Coast Regional Climate model and a Great Lakes Regional Climate model. The intent is to use these regional high resolution climate models, to inform the science that we are providing to you. These model results will be provided through a data portal, which is already in existence.

Physical Sciences Laboratory in Boulder is already providing climate model output to anyone. These are sort of the current class models, they are about a degree in resolution, so you know 60 nautical miles of these high-resolution regional grids that have been developed, or 5 to 10 nautical miles, so higher resolution, which is important, in terms of getting the climate right for a particular region.

We have the climate models under development, we have this information hub under development. Then what the initiative envisions is that each region will have a team of

scientists who are trained in using the climate model output, and are working with you to develop science advice that you need to make decisions, and we call these Decision Support Teams.

Depending on the user, those Decision Support Teams could link the climate models to habitat and distribution mass. They could link those climate models to the species forecast and projections. They could link those climate models to ecosystem-wide forecast and projections. They could link those climate models to the tipping point and threshold analyses. Then some of the applications that come out of those analyses are Scenario Planning, Risk Assessments, ability to help with rapid responses, consultation in the regulatory review processes, management strategy evaluation, and the rebuilding and recovery plan.

Just want to emphasize, you know we had the conversation about Climate Scenario Planning. Out of that effort, no, go back one, please. Out of that effort there is going to be some ideas about what management actions could be taken, or what governance changes could be made, or what legislative changes can be made.

The intent of this initiative is to be able to provide the climate informed science advice that you will need to take those steps, you know using the best science available. Where are we with this initiative? We're putting the pieces together as you've seen. We've had it reviewed by the NOAA Science Advisory Board, and they reviewed it very favorably.

We've requested 20 million dollars in the NOAA FY23 budget request, 10 million dollars to NOAA Fisheries, and 10 million dollars to OAR. We recognize that we need to do this, and we recognize that we need new resources to do this. That is where this budget request has come from.

We're going to continue our pilot projects. We have one in the Northeast, one on the West Coast, one in the Gulf of Alaska, and one in the Bearing Sea. I'm happy to talk about those if there is interest. We're engaging with National Ocean Service in the planning and program engagements,

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and working to communicate this to our external partners, including Atlantic States Marine Fisheries Commission.

Then we're updating our buildout plans for FY23 and beyond. We also understand that there is the need for additional observation on research activities, so we're starting to do the planning there. But that's it, all I have for my presentation today. Again, the intent is to improve the science that you are able to use in making climate informed decisions. Happy to answer any questions, thank you very much.

CHAIR WOODWARD: Thank you, Dr. Hare, any questions for Jon? Jay.

DR. McNAMEE: Thanks, Dr. Hare, that is awesome. I wonder, just I'll focus in on one element. Is the idea, so thinking about, I think it was like the third little icon down. You know stock assessments and projections. Is the idea that you would have this team that might look at, you know a stock assessment.

It's probably just a standard statistical catch at age model, and they would build either, create a model that could incorporate climate information, just for sake of argument, temperature, maybe impacts on recruitment. Hopefully you get the gist of what I'm getting at, but is the idea that you would have a team that might take the existing tools that are being used, and modernize them, you know to kind of provide the climate element into the information that's produced out of that process, or is this something that has a longer arc than that, something that is not quite as immediate as I started thinking about.

DR. HARE: I think it's in the immediacy. You get all the pieces. You know we've been trying to sort of advance climate informed advice for a number of years, Climate Science Strategy in 2015, building on that. In the Northeast Region, I think we're in an excellent place to start taking advantage of this immediately.

There is the Woods Hole Assessment Model, which is a state-spaced model, which can include environmental components and any number of parameters. What we have been missing in applying that model to projections, is the environmental projections of what the future will be. The climate modeling, the high-resolution climate modeling will provide that environmental forecast going forward.

That we can then link to this existing Woods Hole Assessment Model, to provide climate informed projections in the stock assessment arena. There are other examples where we can play that sort of scenario out. But using our current tools in the immediate, and then using that to help build momentum to further advance those tools, and bring new tools on board. I really see this as a helping now and in the future initiative.

CHAIR WOODWARD: Any other questions for Dr. Hare? I don't see any. Thank you for being here. We look forward to it, it's another ambitious undertaking, but certainly one that is going to be vitally important for us to move forward and make the best decisions we can. Thank you.

DR. HARE: Thank you very much for the opportunity.

UPDATE ON THE RISK AND UNCERTAINTY POLICY

CHAIR WOODWARD: All right, at this point I'm going to turn it over to our resident guru of risk and uncertainty, Dr. McNamee, for his presentation.

DR. McNAMEE: I was thinking self-appointed risk and uncertainty Tzar, if that is okay. Thanks everybody. I've got a presentation here. It's a little long and it is stuff you've all seen, maybe more than once at this point, so I'm going to kind of cruise through it. The point of what we're kind of giving you this update for. Start thinking about a couple of questions, which I'll kind of pose up front, and then again at the back end of the presentation.

Is Maya controlling the slides? Thank you so much, Maya, and you can flip to the next one. We'll kind

of cruise through a couple things in this presentation, a little bit of background, just to, you know maybe you're thinking about risk and uncertainty incessantly like me. But if not, I'll kind of reintroduce it.

We'll talk about the tautaug pilot case that we went through, and then these are the questions that we want to kind of focus in on at the end. We're just trying to find a path forward here on this. Some next steps, do you want us to conduct another pilot case? You know what about a data poor version of this? Do you want us to kind of start looking in to that? We've been generally we've been dealing with data rich situations so far. Should we be looking at only ASMFC managed species? Then could we broaden this out? So far, we've been kind of talking about it in a context of reference points and projections, but this could be broadened a little bit. Those are the questions, so I'm introducing them to you now, and we'll put them back up at the end. Just recall that the draft Risk and Uncertainty, we've got a policy and a decision tool, and the point of all of that is to get us to an appropriate and kind of defined and transparent risk tolerance level for some sort of a management decision.

One important distinction is, this isn't management strategy evaluation, it's a little different. This isn't a tool to kind of look at Management Idea 1, and Management Idea 2, and kind of look at the tradeoffs. That is not what this is. That would be a Management Strategy Evaluation. This is more to get us to a point where we can make a more informed decision about, you know generally what we offer as a starting point is, we want our 50 percent probability of reaching the reference point, for instance.

Then sometimes we'll kind of throw in a continuum, but it's not thought about in the context of, it is thought about in the context of risk, but how we're getting to these numbers is not very transparent. That is the point of this, the tool that we're using. Just a schematic of

what the tool is. You've got a series of technical inputs there on the box, if you're looking up at the screen, the left that go in.

Then on the top right-hand side you have a series of weightings. That is the management board's opportunity to say, this one is important and this one is less important. We kind of weight these things in the model, grind it all up in the tool, and out pops a risk tolerance out of the tool. Again, that is usually the goal probability of achieving a reference point is what we've been kind of focused on. It's a simple one to kind of think about.

When we're looking, you know we've gotten a stock assessment and we get some projections. What we're often looking at is, you know a point estimate, which is usually just kind of the center of a distribution of some uncertainty in these projections, so we'll conduct like 1,000 runs with these uncertainties, and you get these different potential outcomes.

Right in the center of it is usually the value that we kind of focus in on. Kind of a default that we use a lot is to say, we are going to use a 50 percent probability. Basically, what we mean by that is, so in the case of fishing mortality you're going to take that uncertainty around the center, and you're going to split half of it will be above that point estimate, and half of it will be below it.

You have equal probability of being above or below the middle of all of that uncertainty. Often what we want to do though is modify that a little bit, depending on the situation that we're in with a particular species. You know the question we often wonder is, well, what is better, a higher or a lower probability?

In the case if we wanted to be more conservative, what we would do is we would set a 60 percent probability, and what we mean by that is all of that uncertainty around that you see up there in these different shades of blue. Those are all potential outcomes, given the uncertainties that we have in the species that we're looking at in the projections. What we're saying is, we want 60 percent of those

potential outcomes to be in the good zone, so below the F target that we're looking at. In a smaller number of those, 40 percent will be above it, so there is still a chance that you're going to be above the reference point of where you want to be, but more of the probability is putting you in the zone where you want to be. That is just a quick trip through the probability discussion that we often have, when we're trying to decide what to do with these projections that we get from stock assessments.

We did a tautaug pilot case, and again the tautaug situation is there are four regional areas, four regions for the tautaug fishery. You can see them up there. This is another schematic, so we had the Tautaug Board got together and we did some online surveying, and we came up with these weightings, so that is a process that we kind of worked on with the Tautaug Board.

It seemed to work pretty good, and so we might try and implement that again. Then we have the technical inputs that came in from the stock assessment folks, and the Committee for Economic and Social Science. They weighed in to fill in those technical inputs, and then we produced a goal probability.

There are kind of two phases. Phase 1 is the development of the decision tool, which is species specific as we have it crafted now, and we did all that for tautaug, so that was great. Then we were ready to move into Phase 2, which is after you develop the decision tool you want to use it. We got to that Phase 2, and what happened was we had the unfortunate situation of good stock status for tautaug across all of the regions.

There was no management action needed for tautaug, so it kind of blew up our pilot test case here. What we did instead was we said, well okay, we can make believe. We provided a couple of different hypothetical scenarios, just to kind of show what could have happened with tautaug had the news been bad and not good.

Just another schematic. We got through Phase 1, we did all of those boxes, and we ended up producing some projections, and because we didn't have kind of a real-world situation to work with, because there was no management action that was triggered by the outcome of the last tautaug assessment. We developed these hypothetical scenarios.

The main things we looked at were, you know no difference, if we needed no difference in harvest, or if we needed between 5 and 10, you know a reduction of 5 to 10 percent in harvest for tautaug. We were able to do that, and this is what came out of that. These were the goal probabilities.

This is without the socioeconomic consideration, so it includes everything, all the technical elements of stock status information, all of these different types of uncertainties that we wanted to incorporate, ecosystem importance. This is where we came out is that table on the bottom there. For the Mass/Rhode Island Region we were at 54 percent.

These are the goal probabilities. Were we to take management action, this is where we would want to kind of end up. Just for reference, tautaug is one of these cases where the default is 50 percent. You can see in the case of Mass/Rhode Island, we would have wanted to be slightly more risk averse in that situation, if you were talking about fishing mortality. Again, we did a couple of scenarios of different potential changes in harvest levels, and the other thing we did was we used some alternate weightings for the socioeconomic components. The Board went through a weighting process, and we got those directly from the Board. What we did here was we showed you, just to show the effects of the tool and what could happen, we changed those up a little bit, just to kind of to show you what the potential outcome is.

This table just shows you that, I think the take-home here, I won't walk through all of it, I did that last time we talked about this. It's there, and I'm happy to answer any questions on it if you have any. But what I want to do is look up there, look at the numbers, and notice that even with, in some

cases, some pretty dramatic changes to like the weightings, or the amount of harvest reduction.

Those risk probabilities don't change all that much, a couple of percentage points here and there. The point is, you know you're not going to get wild swings in this stuff outside of those, the technical inputs. I think some people were worried, in the discussions we've had on this about kind of instability. You know you're going to get wild swings. What we found in this hypothetical situation is no. You know a couple of percentage points, which can be meaningful of course, but not like 10 to 15 to 20 percent. We weren't getting wild swings like that.

Okay, I got through it all. I will stop there. That was kind of a trip through where we've been. If you go to the next slide, Maya, here are those questions again, and so you could read them, we put them onto two slides here, so we'll kind of flip back and forth. But we're basically looking for a little guidance, and there is kind of like two main paths that we could go down here.

You could say, Hey Jay and Sarah, please do some more pilot cases, you know do some more testing before we adopt this, or we could go ahead and move forward with adoption, not today. But if that was something you are interested in, I think between now and even the annual meeting, I could confer with Sarah.

We could kind of scope out what that looks like, and come back to you to sort of give you at least our idea of what kind of finalizing this would look like, and then how it would move forward from there. The reason I pose it that way is, you know there is really not anything coming up in the very near future. My personal fear is, you know red drum is like one we could potentially test, and that's one of the earlier ones, and that is 2024.

If we wait until then, and we don't talk about this again until then, I'm going to have to go through this whole presentation again, and

walk you through all the stuff that we did. You know it's been a long time that we've been working on this already, and this would push it out even further. But understandably, and this was the advice we got after the tautaug version was, you should test it on another species. The problem is that the next species is kind of a ways off.

We're looking for guidance on, move forward or do another test. There is a notion of how about data poor species. We haven't really tinkered with that yet at all. Again, there is nothing on the horizon that would give us sort of a real-world version of that, but we're good at make believe, so we could kind of come up with something. Then next slide, a couple of remaining questions there, like should we just be thinking about this? You know the jointly managed species, they have their own risk policy already built in, so maybe we don't need to do anything there. Although I would suggest maybe it could be valuable in some of the specification work that we do at the Commission, with regard to the jointly managed species, which I don't think would necessarily interfere with the existing risk policy.

Again, so far what we've worked on have been kind of data rich situations. Another one, we could test it out on a data poor situation as well. Mr. Chair, that's it from me. Hopefully that didn't take too long, and happy to take any questions.

CHAIR WOODWARD: Thank you, Jay. Questions. Lynn.

MS. LYNN FEGLEY: Thank you, Jason, it's great. It's just really fun to see this go into implementation. I have a few questions, and the first one is, in the tautaug example. The Decision Tool was created, but you didn't get to implement, because you didn't have to, because stock status was fine. The question is, how long does that Decision Tool stay in play? Is it in play for the next assessment? Is it done, or is it an idea that it would be rerun every time a new management action happened?

DR. McNAMEE: That's an awesome question. I don't know that we've talked too much about that. I suppose, this has a shelf life. I don't know that it's

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a super long shelf life, but there is not reason to think that you would have to redo, for instance the weightings over and over again, unless there was some impetus to.

Maybe what could happen prior to a management decision is just a quick half an hour review of those weightings, to see if they still make sense to people, or maybe the situation has changed, and you wanted to tweak one. We could have that discussion at the Board, and that was always the intent is that we're having these discussions, they get recorded.

We know why we changed these things, it's sort of documented. I think once you get it developed, it's like tinkering, but not like a full-blown redo each time. I think Sarah might be out in radioland somewhere, if she wanted to weigh in on that. But hopefully that was adequate.

MS. SARAH MURRAY: Hi, yes, I am here, and can chime in if that is all right with you, Mr. Chair.

CHAIR WOODWARD: Sure, go ahead, Sarah.

MS. MURRAY: Thank you. Yes, all of what Jason said was correct. I think it depends on different species to a certain extent. But a lot of these components, for example ecosystem importance. They are not likely to change, so it would be more a case of the TC taking a quick review of something.

If they happen to know that some new study came out that really changed the scientific world's thinking of a species role in the ecosystem, then for example that might change, or the environmental uncertainties run, if there was a new study that indicated a species was a lot more sensitive to temperature than previously thought, then that might change. But some of those otherwise can stay pretty static. The socioeconomic components would be updated, based on the current data

and the stock assessment components would obviously be updated with the current stock assessment information. However, I think once the TC and CESS has gone through this the first time, it should be relatively straightforward. I think a lot of it is getting used to the process.

CHAIR WOODWARD: All right, thanks, Sarah. I've got Joe Cimino and then Justin Davis and then Pat Keliher.

MR. CIMINO: Lynn, that was a great question. Thanks, Jay. I agree, I'm worried about like the timing of this. But I do think cobia is a great candidate species, and I'm kind of wondering about its partner. Spanish and cobia are their own Board now, and Spanish just went through an assessment. You know looking back at some of the more recent assessments that just happened, if other Board members think that Spanish might be a potential candidate.

Then you know I don't know about data poor, Jay, but I agree with you. I kind of would be interested to see how this would play into our jointly managed species with the Council's Risk and Uncertainty Policy. Lastly, Jay, I just want to thank you for the probability illustration. I think we need that at all our striped bass public hearings, to kind of counter the, we're just managing on the flip of a coin.

CHAIR WOODWARD: All right, Justin.

DR. JUSTIN DAVIS: This follows a little bit from Lynn's question, but Jay, am I correct that even if we left the weightings in place and didn't touch those, that the probability recommended by this process could ultimately change over time, because some of the technical inputs, I think, come from the stock assessment, so as stock status changes, we could end up with a different probability, even without changing the weightings.

DR. McNAMEE: Yes, thanks, Justin. No, absolutely, and thanks to Sarah for kind of broadening out. I was thinking Lynn's question was directed towards what the Board might have to do. The technical inputs would get updated, right. They would be

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different for each new process. But that again would be sort of an automated process. They have these numbers, they just kind of plug them in. The CESS information that's a little different. I think that is a bit more work. Those technical inputs get updated, so yes, those would change.

CHAIR WOODWARD: All right, Pat Keliher.

MR. KELIHER: Jay, this is great. Those of you around the table are going to be much more in depth about commenting on the technical side of this. But from a policy perspective, I'm looking at your last question to the Board, should we require the Commission to conduct this process when a relevant action is being expected. But then you talk about the data-rich component of this. I think that speaks to the fact that we probably should look at a data-poor species, to make sure that we have the information that we need or the comparison that we need.

CHAIR WOODWARD: We've got a request before us, and you've got the Tautaug Board has obviously expressed their opinion of applying this to another species and fishery. What is the general consensus of the Policy Board here regarding at least that question? Lynn.

MS. FEGLEY: I hope I'm going to address that question. I might not. But I was just going to say that I think I like the idea of doing another test case, and maybe cobia, red drum, I think either one of those would be great. But I also wanted to flag that I think part of this too needs to link to, because part of the idea of this was transparency.

But codifying to the public how we're arriving at the uncertainty level. I also think we need to think a little bit about how we're transmitting this Decision Tool to the public, and whether that goes as a piece on the species website. You know if you look up tautaug, where it's got all the stock status fishery. Maybe there is a

little section add-in that says, you know what's our risk tolerance. I just wanted to slide that, but I think another test case would be good.

CHAIR WOODWARD: Sort of what I think I'm hearing is another test case in a real-world situation, and maybe a data-poor simulation would be informative. It sounds like, I think at least from what I'm hearing, John Clark, go ahead.

MR. CLARK: Just based on Jay's presentation. If we do ask Jay to do those test cases, given the timeframe he was talking about there. That would push finalization of this off for another two, three years, correct? Is it possible to kind of do both to finalize the policy while those would be the first cases that you used; you know kind of an actual tool in the management of those species?

CHAIR WOODWARD: I guess that's a question for us, really. If we approve it for use, and we don't like what happens with it, because we don't feel like it was necessarily vetted to a satisfactory level to understand it. You know I don't have strong feelings one way or the other, but go ahead, John.

MR. CLARK: As Jay showed with tautaug. It doesn't change things that much, but it does add more inputs to the model, which I think would help with the public, to show that we were considering everything. Personally, I don't have a problem with going ahead and finalizing it, just because, and I would like to see those other species done, but you know as Jay said, we're pushing the whole decision off then for several more years, if we do that.

CHAIR WOODWARD: Cheri.

MS. CHERI PATTERSON: I agree with John. I think we should finalize this as far as it has gone. I presume that it will be going through modifications considering its infancy at this point in time. In the future it will go through future modifications as we learn more. I agree. I think that a data-poor species would be very informative for me to see how this acts, and I certainly don't mind having one of the southern species cobia, red drum brought forward.

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But I would like to see how the data-poor species reacts. Thanks.

CHAIR WOODWARD: Sorry, Erika, for skipping over you.

MS. BURGESS: It's okay, Mr. Chair. This is very interesting. I don't know if everyone around the room knows that the South Atlantic Council has been working for the last four years on their ABC Control Rule, which is intended to set the management uncertainty, so very similar to this. But this considers different parameters, more parameters than what the South Atlantic Council is looking at. To that first question up there, it makes me wonder. It makes me a little hesitant to think that Spanish mackerel might not be the best first test case for this.

Spanish mackerel is being reviewed by the SSC today, and we expect there to be some revisions to the assessment, hopefully by NOAA Fisheries after the SSC has their discussion on it. Reading the last sub-bullet there that it's only applicable to data rich quota managed species. I think that red drum then isn't a candidate, because the management goal for red drum is an SPR target, it doesn't produce a quota for the stock to be managed at.

CHAIR WOODWARD: All right, Chris Batsavage.

MR. CHRIS BATSAVAGE: Yes, I was wondering if Spanish mackerel, how that would work, being a Council managed species first and foremost. Although the timing for the stock assessment would be good. Maybe an idea to close the gap between the 2024 assessments and now.

It might cover the data poor aspect too is, we have a black drum stock assessment that should be available by early 2023. I'm not sure if that is a good candidate. I mean I think timing wise it might be, but assessment wise to the risk and uncertainty tool, maybe not. I'm just throwing that out there as a potential idea.

CHAIR WOODWARD: Go ahead, Jay, you want to respond.

DR. McNAMEE: I had actually started to think in the same way as Chris, so that could be sort of a middle way here is, we don't have to wait all the way into some point in 2024, we could, you know black drum I hadn't realized was coming up that quickly. But I was even just thinking, we could take a data poor species and just apply it to that.

Now again, we would get into the situation like tautaug, where there wouldn't be like impending management action. But maybe with black drum there would be. That might be a way to kind of keep the momentum going, and not have to wait, but not get too far out over our skis. It sounded like there was some hesitancy amongst the Board.

CHAIR WOODWARD: Erika.

MS. BURGESS: In that case with black drum, we're in the same scenario with red drum, so would you look at your risk and uncertainty for achieving your SPR goal, rather than basing on a quota. Because I think about red drum. We actually are aiming to exceed that SPR, and so that's kind of like a minimum threshold.

DR. McNAMEE: It's a good question. It seemed like the same situation that you brought up for red drum. I think it should work. It's just a different metric. But I think, I would have to understand a little bit more about the kind of technical infrastructure there, to know if it applies directly. But that makes it fun to look at and try and figure that out. I think we could investigate it at least.

CHAIR WOODWARD: Thanks, we sort of need to wrap this up. I know I certainly don't want to give this short shrift, because it's extremely important. How about contingent approval of the policy, and do as has been suggested to run black drum through as a data poor, see how that comes out. Revisit after we get the results of that, and see whether or not we need to tweak it. Does that sound like a reasonable sort of middle ground, as Jay described?

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MS. MURRAY: Apologies, Mr. Chair, I don't have a way to raise my hand, since I am an organizer. But would it be all right if I chimed in here on timing?

CHAIR WOODWARD: Sure.

MS. MURRAY: I may be, someone correct me if I'm wrong, but I think I was hearing an early 2023 deadline for black drum assessment. I just want to point out that the process, especially as we are running this through the first time with Boards and TCs takes a bit of time to get going. I think we went through six or nine months with tautaug.

I don't think in the long run it will take that long to do, but especially as Board's are getting comfortable with doing this the first time, and TCs are getting comfortable with doing this the first time, and setting up the decision tools. It takes some time to do. Also, without knowing specifically the nature of the assessment, the tool that is ready to go is specifically designed for the data rich.

I would want to confirm that this tool wouldn't need to be altered significantly, before promising that we can use it on any data poor. Not that we can't in the future, it just may add additional time if there is adaptation needed beyond something pretty straightforward.

CHAIR WOODWARD: Yes, I see Jay's head nodding, so I think our expectations are based on that. We don't have any unrealistic expectations of a product delivery. Is everybody still fairly comfortable with that approach? I see heads nodding, so okay. Thank you. Thank you, Jay, thank you as always for your work, and if you want to be called the Tzar, you can be called the Tzar of Risk and Uncertainty.

TZAR. McNAMEE: Thank you, Mr. Chair.

COMMITTEE REPORTS

CHAIR WOODWARD: All right, our next agenda item, I want to call on Nicole Costa to give us a NEAMAP Report.

NEAMAP

MS. NICOLE LENGYEL COSTA: I'm going to be brief; this is just a sort of update to the Board on NEAMAP activities and our next steps for the program. I'll just give a brief overview of NEAMAP, cover our mission and goals, talk briefly about the NEAMAP name, and the efforts of our Survey Criteria Working Group, and then I'll get into the bulk of what we want to update you on, which is the NEAMAP Survey definition, and our next steps for the Operations Committee. We continually like to remind the Board and others that NEAMAP is in fact a program, it's not one specific survey. It's a cooperative state federal program facilitating fishery independent data collection, analysis and dissemination in the Northeast from Maine to North Carolina, and the current NEAMAP Surveys include the Southern New England/Mid-Atlantic Nearshore Trawl Survey, operated by VIMS. The Maine/New Hampshire Inshore Trawl Survey, and the Massachusetts Division of Marine Fisheries Bottom Trawl Survey.

Our NEAMAP partners include state marine fisheries agencies from Maine to North Carolina and DC, ASMFC, PRFC, both the Science Center, New England Council, Mid-Atlantic Council and Fish and Wildlife Service. We also have quite a bit of collaboration with the SEAMAP program on programmatic and process advice. Collaboration on technical workshops, including a vessel collaboration workshop and sampling protocols. This slide is just to acknowledge our NEAMAP partners.

Again, thank you all and the various committee members from these partners for their continued efforts. Where a particular fishery usually operates on a small spatial scale, NEAMAP covers a much larger geographic range, and this makes the data particularly useful in a variety of ways in stock assessments, including developing indices of

abundance used in the models, fecundity estimates, developing length/weight relationships, size or age composition outside of the fishery, stock structure in areas where the fishery doesn't operate, and evaluating shifts in stock distribution.

Here are some specific examples of NEAMAP data uses. The full list of species is quite a bit longer, but for the Maine/New Hampshire it's been used in lobster, shrimp, herring, and ground fish. The Massachusetts survey for black sea bass, scup, cod, lobster, summer and winter flounders, and the Southern New England/Mid-Atlantic for summer and winter flounders, black sea bass, spot, croaker, weakfish, river herring and lobster.

I know these plots are rather small. It's not intended for you to actually be looking specifically at the plots, this is just an example of how some of the data were used in a coastal ocean and Chesapeake Bay trend comparisons, using the VIMS data. A few years back the NEAMAP Mission and Goals were revised to shift from design and implementation to enhance coordination and methodology.

The goals and objectives specifically addressed collection and analysis of fishery independent data for assessments in management, enhancing coordination among the fishery independent surveys, and promoting use and dissemination of this data, identifying and prioritizing the short and long term needs of the program, and securing funding for NEAMAP activities.

A little bit about the NEAMAP name. As I stated earlier, the current NEAMAP surveys included the Maine/New Hampshire, Mass DMF, and the Southern New England/Mid-Atlantic. These surveys have built a relatively robust reputation for NEAMAP. In having the meetings of the Operations Committee, it became clear that there are a lot of additional fishery independent surveys run by NEAMAP partners, that also address the NEAMAP goals and objectives.

These include surveys run by Rhode Island, Connecticut, New York, Delaware, Maryland, and North Carolina. We begin putting a lot of careful consideration into whether or not we should add these surveys to the NEAMAP name. We previously presented this idea to the Policy Board, and they urged us to use caution in doing so.

We definitely have taken that and have been thinking really considerably, about how to do this if we should do this. Additionally, we've seen increased reference to following NEAMAP protocols, and wind energy development surveys that are coming online up and down the east coast. This kind of caught us off guard, because NEAMAP doesn't have any official protocols.

The surveys under NEAMAP individually have protocols and sampling protocols that they follow. This kind of flagged us that perhaps there is a need to think about and develop some specific NEAMAP protocols or survey criteria, so we could one, ensure that any additional surveys added to the NEAMAP name are using consistent methodology, and two, safeguard the NEAMAP name, and make sure that any survey following NEAMAP protocols has sources that they could properly cite.

We decided to develop a survey criterion working group as a starting point. The working group was tasked with reviewing NEAMAP survey data elements, and determining common baseline survey criteria. This was a large effort by our Technical Committees and Dustin Gregg at VIMS did a tremendous amount of work on this, so I wanted to just give a shout out to him.

It became quite clear after this working group got together that there are still a lot of differences when you get down to the details in all the surveys. Maybe it was a little, I'll say maybe we bit off more than we could chew, in just trying to dive right into specific criteria. We decided to take a step back, and maybe come up with a more holistic approach.

At our annual meeting we decided to move forward with developing a broad definition of what a NEAMAP survey is, and then develop some guiding

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documents for specific topics, such as gear sampling methods, biological sample tracking, and QA/QC protocols. When developing this definition, we thought it was important to highlight who conducts the surveys, who designs the surveys, and what they are designed for.

The spatial coverage, as well as who reviews the surveys and decides whether they fall under the NEAMAP name or not. This is the definition we came up with. NEAMAP surveys are conducted by NEAMAP partners. They include both partner and committee designed surveys, and operate on local and regional spatial scales.

They're designed to collect long-term fishery independent data on species abundance, distributions and life history, as well as related ecosystem and environmental information. NEAMAP surveys are reviewed and approved by the NEAMAP Operations Committee. NEAMAP data are collected to support fisheries management, as well as to enhance knowledge of marine fish and invertebrate stocks and the ecosystem.

I realize this is a rather long definition. This was designed specifically with the existing surveys in mind. I'll give you just a sec to digest that. For our next steps, now that we have this definition. We would like to establish a high-level set of NEAMAP principals. Right now, our Operations Committee members have each signed up for sort of topics, and they are starting to flesh out what these guiding principles for the different topics could be. Again, those could be vessel and gear, QA/QC protocols, actual sampling methods, biological sample tracking.

We're going to meet and then talk about further steps, but it could be a very high-level set of principles. We could get into more detailed criteria. But we essentially want to develop some guidance documents for these specific technical topics, and then review the

other existing fishery independent trawl surveys for possible inclusion under NEAMAP.

It's not our intent that when a survey becomes an official NEAMAP survey there would be any funding implications or expectations. The purpose and value added is to promote consistent, high quality data collection and dissemination through collaboration among all the surveys, and additionally the development of these specific protocols will provide the proper resources for other surveys to follow, and cite, should they choose to do so. With that I will take any questions.

CHAIR WOODWARD: Thank you, Nichole. Questions? Jim Gilmore.

MR. GILMORE: Thanks, Nicole, good presentation. If we standardize this, do you think or has the group thought anything about maybe some conflicts with, for instance New York. We do our nearshore trawl survey with State University of New York at Stonybrook, and we've got principal investigators.

Now, if essentially, we're going to go out and we're going to have, well, here is a principal investigator, we want you to do this. But here is your set of rules, and they maybe don't like those rules, because they are different professors, and they have different approaches to things. Do you think there will be any issue with that if we standardize this?

MS. COSTA: That's a very good question. We've talked a lot about this. We want to develop this definition and these guiding principles, not to have anybody change their existing surveys. We want to be inclusive of additional surveys, and we want to at the same time make sure that everybody is operating consistent methodologies.

We plan on developing these guiding principles, first looking at the existing surveys under NEAMAP, and then as well looking at these additional fishery independent surveys that are already operating. When the Survey Working Group went through the criteria, they primarily were focused on the NEAMAP surveys.

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But we had all of the other state partners fill out the Excel spread sheets as well. We are going to be looking holistically at all the surveys, and then unfortunately, it will take some time. I can't give you a direct answer now how it will shake out. But we do intend on considering that.

CHAIR WOODWARD: Follow up, Jim?

MR. GILMORE: Yes, just on the broader issue. I really would like to see it just called NEAMAP, because it has such a history, if you go back to when they first started. NEAMAP, I think when I first started, was going down. Nobody had money for it, and I know my state came up with a half-million dollars to keep it going. Then I think Massachusetts jumped in there, and they were going to try to take and fund it, whatever.

Then all of a sudden, years down the road it's like, well, I'm not even sure we're a NEAMAP partner anymore. It just got to be, it's a great cooperative effort for everybody, and then saying NEAMAP partners, they think we're all partners in this, and I think it's time to maybe just say NEAMAP is us, not NEAMAP is this group of folks, or whatever. Just a suggestion.

CHAIR WOODWARD: All right, Jay.

DR. McNAMEE: Thanks, Nichole, nice presentation. I'm kind of like processing what Jim was just saying. Maybe I'll start with, this is going back a couple years. I was a proponent, just because I thought NEAMAP was awesome. You know as I go, if New Hampshire and Maine are in there, you know Rhode Island should be too.

I really like the idea, mainly because I wanted to kind of attach our great survey with another great survey. Since then, though, I kind of, you know there's a, and I'm being a little tongue in cheek, but there is magic in NEAMAP right. It's a survey, and has a lot of industry buy-in. Like people when you talk about an assessment, and you know people will scowl at you. Then you

tell them NEAMAPs in there, and all right, now it's good.

That is great. I mean that's what we want. I worry about watering that down, and in particular if the idea that you and Jim just discussed is that there wouldn't be any sort of omnibus standardization. I guess I don't kind of see the point then. Like, we can keep NEAMAP as NEAMAP, and the Rhode Island Trawl will be the Rhode Island Trawl.

We're all partners, just like Jim said, and that is fantastic, and there are all sorts of now statistical tools to kind of weave these things together, thinking of things like bass, all sorts of hierarchical modeling that we can do to kind of patch the indices together, if we want to. I don't see a lot of efficacies in trying to incorporate all of these other satellite surveys into, and calling it NEAMAP.

I just wanted to offer; it wasn't a question. I just wanted to offer that comment that maybe things are okay. I think we have the tools we need to be able to pull things together when we want. But they are different surveys, and so I don't see a lot of need to call them the same thing. One final comment is, I really like the idea though of developing, kind of the NEAMAP principles, because of now these external entities that are kind of kicking that name around a little bit. That part I think is good and invaluable.

CHAIR WOODWARD: Eric, I assume you're moving in the microphone, because you want to talk.

MR. REID: You would be correct, so thank you. Yes, I agree with Jay. But I am concerned about the use of the brand by the wind people. That does concern me. You know when they say they're following NEAMAP protocols, my understanding, in my little narrow view of the world is, they might be towing the same gear.

You know they are towing the Bigelow gear, which is the NEAMAP gear, essentially. But I don't know if we should, you know there is no protocol, so what are they following? They're towing the same gear. I can tell you, there is one vessel that's doing a

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survey, and I can tell you, he is very on top of making sure the gear is set just right and the spread is just right.

But I know for a reasonable fact that not everybody does that. That in itself is concerning to me. I don't know, NEAMAP should send a letter to BOEM saying, you can't be doing this, because they shouldn't be doing it. To cite something, one that doesn't exist, and pretend like they're doing a stellar job like NEAMAP does. I would disagree with that. I don't know, Mr. Chairman.

MS. COSTA: I think the Committee at our annual meeting had similar discussions. We, you know recognized, if you do a quick search, you can see there are a multitude of surveys that are using that language, and they're not going into details like you said, about what specific protocols they are following.

Before we could really question what protocols they were following, the Committee felt, well maybe it is time for us to develop protocols, so then we can go to perhaps an individual survey or, you know ASMFC could go to them and say, you know here are our protocols, are you in fact following them, and if not, perhaps that language isn't appropriately used.

CHAIR WOODWARD: Pat Keliher.

MR. KELIHER: I just want to echo what Jason brought up for points. I am in complete agreement with those, and I think by developing those protocols, it helps to address the issues that Eric is raising. If they are just doing one portion of the work, and it's not all of those protocols that have been developed by NEAMAP, then we can have something to stand on if we did have to send a letter.

CHAIR WOODWARD: All right, it sounds like copyright infringement to me. Any other questions or comments for Nicole? I don't see any, so thank you very much.

LEGISLATIVE

CHAIR WOODWARD: All right, we're going to move on to some committee reports. I'm going to call on Bill Hyatt, our Legislative Committee Chair to give us a report on that committee, as well as a request for approval of a letter of support for House Resolution 7801. Bill.

MR. WILLIAM HYATT: Thank you, Mr. Chair. I do have a very brief report, one sort of ask to make to the group. Then as you mentioned, that one action item, assuming that the support letter is an action item. Our Committee, the Legislative Committee, has been very active this year. We've had eight meetings. A big thank you goes out to everybody, all the folks that have been involved, and especially to Deke, for keeping us organized and on task. We have engaged on a number of different pieces of legislation, engaged with members of Congress. We've also engaged with members of Congress and agencies relative to appropriations for fiscal year '22 and '23, and we've prepared a number of different background documents and talking point documents for distribution to the Commissioners. That is kind of a very quick, in a nutshell summary of what we've done.

One of the pieces of legislation that we've engaged in most deeply, is the Recovering America's Wildlife Act. That brings me to my ask for this group, and those of you who were at the luncheon yesterday, this is somewhat of a repeat of that. Basically, that piece of legislation has been six years in the making.

I'm going to assume everybody around the table is well versed in the Recovering America's Wildlife Act, and that it is aiming to bring 1.3 billion dollars on an annual basis of permanent funding to state Fish and Wildlife Agencies, which will undoubtedly have some very significant impacts to marine programs in all of our Atlantic Coast states.

This piece of legislation has now progressed through. It's been voted out of committees in both the House and the Senate. It has been voted on the House floor. The House has approved it, and it is only awaiting approval in the Senate, before it will

be enacted into law. There is an “if” though associated with that.

It definitely needs to come to a vote in the Senate during the month of September. As you can imagine, I’m sure all of your experience tells you at the very end of a session there is a pretty big log jam, in terms of getting things approved and up for a vote. My ask to all of you is to consider and do what you can, to get the word out to your Senators.

A very simple message/ask that you really need to, and really support and your constituents really need and support for the Recovering America’s Wildlife Act to get on the agenda for a vote. In addition to you reaching out as you are able, I would ask that you reach out to those organizations amongst your constituents, who would have similar desire to have this legislation pass.

Simply because the more people that these Senate officers hear from, the more people that staffers hear from over the next month, the greater the likelihood that this bill is going to come to a vote in September. We’re entirely confident that if it does come to a vote, that it will pass. That is my ask to each of you. If you take home anything from what I said today, please take that message with you.

I think that brings me to the action item, which is a support letter for H.R. 7801, the Resilient Coast and Estuaries Act. This is a piece of Legislation that we discussed at the Legislative Committee, that is something that we thought the Commission should support. We brought it to the Executive Committee at a previous meeting, discussed it there.

It was consensus that it was something that the Executive Committee wanted to consider. They asked us to draft a support letter, which we did, and which was brought to the Executive Committee yesterday, and now as I understand it, the next step is to get approval from the Policy Board, in order for that to happen.

Briefly, just to go over a few things in H.R. 7801, The Resilient Coast and Estuaries Act, bill summary, it reauthorizes funding for the Coastal and Estuarine Land Conservation Program at 60 million dollars per year for fiscal years ’22 through ’26, and it authorizes funding for the National Estuarine Research Reserve System, at 47 million dollars per year for fiscal years ’22 through ’26.

In addition, it directs the Secretary of Commerce to designate at least five new national estuarine research reserves during that period. Background that I’m sure most of you are familiar with. Nationwide there are 30 of these reserves, and 17 of them are located along the states along the Atlantic Coast.

That is a very brief 10,000-foot summary of the Legislation. With regard to the support letter, it is a letter of support. Our intent is for the Commission to send that to the Committee Chair and the ranking member. Then simply for those of us in the Commission to have both the letter and some talking points that Deke has prepared in their back pockets, for opportunities to have those conversations. With that, Mr. Chair, I assume that is what you need to get approval here today.

CHAIR WOODWARD: Yes, thank you, Bill. As you said, you know this is an important and very relevant piece of Legislation. I know the state of Georgia has benefited from Kelp Grants in the past. You know it’s been an important source of information for critical habitat acquisitions. This expands it out to allow funding of restoration, which obviously is part and parcel of us dealing with climate change, and lots of other things.

You know as Bill said, the Executive Committee gave it a unanimous support. What I’m asking for here, is there any opposition to this letter of support from the Policy Board? I don’t see any heads shaking. We’ll consider that supported by the Policy Board, and we’ll get this letter out. As Bill said, we’ll make it available to everybody.

If you have an opportunity to weigh in on it, just as he suggested, with the Recovering America’s

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Wildlife Act. As he said, that one has gone on a long time, and it is literally sitting, the ball is perched on the goal line, and it would be a shame to have a goal line defense stop it from getting across. But it's going to take a lot of effort to get that ball across that line. Anything you can do would be appreciated, so thank you, Bill. Pat Keliher.

MR. KELIHER: Yesterday at the Executive Committee meeting we had a presentation from ROSA that was referenced earlier in your report, where they were asking for additional funds. Over the last two days I've been getting information from my Governor's office on the fact that there is going to be a press conference on another federal bill that is going to be heard, that was submitted by Representative Whitehouse.

It's called the RISEE Act, it's a reinvestment act for offshore wind lease revenues, and it will be a revenue sharing concept that will also allow states, territories, tribes to apply for grants. It's a fairly significant pot of money. Considering the conversation yesterday, and considering the work that all of us are doing from a wind perspective. I would request that we spend some time, the Legislative Committee spend some time on this particular topic as well, and bring something back to the Board, and potentially support this piece of legislation.

CHAIR WOODWARD: Thanks, Pat, for making us aware of that. Bill, I'll trust that you all will take that under your umbrella.

MR. HYATT: Absolutely. That is a piece of legislation, vaguely familiar with, Deke put together a synopsis really quick and looked at it, and I think it's something we would very much like to take up and discuss. I think one of the items we would want to discuss, probably out of the gate, is some of the definitions in the act about the eligible states, and take it from there, but absolutely.

CHAIR WOODWARD: Thanks again, Bill.

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ATLANTIC COAST FISH HABITAT PARTNERSHIP

CHAIR WOODWARD: All right, I want to call on Dr. Lisa Havel, she is online. She's got a couple of committee reports from the Habitat Committee, as well as the Atlantic Coast Fish Habitat Partnership. Lisa, the floor is yours.

DR. LISA HAVEL: I'll start with ACFHP, since that's just informational, then move on to Habitat Committee, where there is a possible action. I'll try to be as quick as possible. The ACFHP Steering Committee met July 20 to 21, where you all are right now, in Arlington, Virginia. We mostly focused on our Strategic Planning.

We had discussions on operational funding and grant administration over the next five years, and also how the next five years are going to be different than our previous five years, especially in regards to funding opportunities, in particularly infrastructure bill funding that is coming out, compared with our strength/weaknesses and what makes us unique.

Now these discussions are being taken into consideration for our next plan. We'll release the plan in December of 2022. Since I last provided an update, the fiscal year 2022 NFHP projects were approved, and ACFHP was able to fund five on the ground projects plus operational funding with this funding, and \$250,000.00 went for on-the-ground restoration, and this is the highest amount to date for us.

We have projects in Maine, Massachusetts, Connecticut, New Jersey and Maryland. Combined, these projects will open over 185 river miles, provide access to over 9,000 acres of spawning habitat, and restore over 4.5 acres of benthic habitat. The first project is Baskahegan Lake and Crooked Brook Flowage.

This is led by Atlantic Salmon Federation. It's a pool and weir fishway at Baskahegan Dam in the Penobscot Watershed in Maine. The Dam is a complete barrier to alewives and other species, and access will be restored to 8,960 acres, and 137 river

miles. They anticipate that 2 million alewives will benefit from this project.

Here is the current barrier, the Dam. Our next project is the Ames Pond Dam Removal and Fishway Construction. This is led by the town of Braintree, and it will remove the Ames Pond Dam and install a pool and weir fishway around Rock Falls on the Monaquot River in Massachusetts.

This will restore access to 180 acres of spawning habitat, and 36 river miles, will benefit river herring and American eel, and these two barriers are two of three on the river, and the third barrier was the Armstrong Dam, and we helped to fund that removal last year. Here is an aerial view of both of those barriers. The third project is dam removal and restoration at Merwin Meadows Park. This project is led by Save the Sound, and it consists of the removal of the Dana Dam, which is also partial channel realignment, on-site sediment use on the Norwalk River in Connecticut.

It will reconnect 6.5 upstream miles, forming 17 miles of free-flowing river to Long Island Sound, will benefit river herring and American shad, and will remove a safety hazard, reconnect 1.13 acres of floodplain, reduce physical and chemical impact and educate visitors about the benefits as well.

Here are two images of the Dana Dam ready to be removed. This is our fourth and final Dam project. This is the Paulina Dam removal is led by the Nature Conservancy in New Jersey, and they will remove the Paulina Dam on the Paulins Kill, combined with the Colombia and County Line Dam removals, which we previously funded in 2018 and 2021.

This will open up a total of 45 river miles of mainstem and tributary, to benefit American shad, American eel and sea lamprey. The project will enhance recreation and public safety, improve water quality, restore hydrology, and improve terrestrial and aquatic

connectivity. Here is the Pauline Dam that hopefully soon will not exist.

The final project that we funded was the South River and Herring Bay Oyster Restoration project, which is led by the Chesapeake Bay Foundation. This project will augment existing hard bottom within two protected oyster sanctuaries along mainstem and tidal tributaries of the Chesapeake Bay.

It will increase the oyster reef in Herring Bank from 0.68 to 2 acres, and it will increase the reef in Glebe Bay from 0.86 to 3 acres, and this work will combat overfishing and sedimentation, and they are working to engage two communities in the restoration plan, oyster gardening, and throughout more of the project as well.

Here is a Google Earth image of the two locations for the augmentation. As always, ACFHP would like to thank ASMFC for your continued operational support, and then I'll jump right into the Habitat Committee report and save questions for the end.

HABITAT

DR. HAVEL: The Habitat Committee met virtually on May 23. We had a discussion about the update on the Acoustic Impact Habitat Management Series, which is moving along slowly but surely.

We also had a presentation on the state of Delaware River sturgeon, and the Northeast Regional Habitat assessment. We selected our habitat hotline topic for 2022, which will be promoting resilience in vegetative coastal habitats. As usual, that will be released in December. We continued working on State Climate Change Initiatives Document, and the Fish Habitats of Concern.

As far as the Fish Habitats of Concern, a brief update. The Habitat Committee has drafted Fish Habitat of Concern designations for all Commission- only managed species, plus Atlantic sturgeon. The thinking with sturgeon was that eventually sturgeon hopefully will go back to being managed under the

Commission, eventually. The thinking for only focusing on Commission-only species were those jointly managed with the Councils have EFH and Habitat Area of Particular Concern definitions already. For Fish Habitat of Concern designations, some species have specific designations, where the other species have less-specific designations, and this is due to species characteristics, and also data availability.

We did not want to just describe all of the habitat, but we used the HAPC guidelines in the designation. A draft Fish Habitat of Concern designation example was provided in supplemental materials, and that was Atlantic croaker. When creating the designations, the Habitat Committee considered current Commission documents, including FMPs, species habitat factsheets, habitat management series publications and more.

They considered current literature, they also considered ACFHP species habitat research. The draft designations were discussed and agreed upon, and then shared with the Technical Committees for edits. All but two of the species have been completed, and so the plan is to share the full document with the Policy Board within the next few weeks.

Then hopefully you'll have time to review it before the annual meeting, and we can vote on whether or not to approve it in November. The final update is the State Climate Change Initiatives document. This was provided in briefing materials, and it's an update to the 2018 publication.

It contains information on current climate change initiatives, and identifies high level progress along the coast since our 2018 publication. It's meant to be informational, and provides a snapshot of initiatives underlying each state. These initiatives do not necessarily reflect the views of the Commission, and that is stated in the introduction of the document.

As we did in our 2016 and 2018 publications, we grouped state initiatives into eight categories. They are listed here, for time I won't go into all the details. But they are provided in the briefing materials. For each of the eight categories, the blue in this graph represents the number of states who initiated that task by 2018.

The orange is the number of states that have initiated it by 2022. The gray is the number of states that have not initiated that task. You can see that most states are active in each of the eight initiatives. There are only a few initiatives where one or two states have not taken any action on them. You can see a breakdown of each state's work in the table provided in the briefing materials. That table will be exhibited as an appendix in the final document.

For today I am hoping to have this climate change document approved, and then if it is approved the next steps will be formatting, and then sharing it, releasing it likely. With that I'm happy to take any questions on either ACFHP or Habitat Committee, and I am open to a motion to approve the climate change document as well. Thank you.

CHAIR WOODWARD: All right, thank you, Lisa, any questions for Lisa about her presentation? I don't see any. We do need Policy Board approval of the update, as she referenced in there. I don't know that we need to do a formal motion. Is there any opposition to approving the update document as was in your briefing materials? I don't see anybody shaking their heads, so all right, we'll consider that approved by unanimous consent. All right, well thank you very much, Lisa.

ASSESSMENT SCIENCE

CHAIR WOODWARD: All right, next I'm going to call on Patrick Campfield for update on the Stock Assessment Committee, and then I think after him we'll have Dr.'s Drew and Anstead give us an update on the progress of River Herring and American eel stock assessments.

MR. PATRICK A. CAMPFIELD: Thank you, Mr. Chairman. The Assessment Science Committee met in May. Their three main topics were to receive a final presentation on the red drum simulation assessment. That was a big project that finished earlier this year successfully. The Committee also discussed assessment training workshops that we will be planning for this winter, and into 2023, and also, the usual business of reviewing the Commission's stock assessment schedule.

The schedule is in your Policy Board supplemental materials on Pages 36 and 37. This is a little tough to read, but the major proposed changes for the short term in 2023 and 2024, are that the black sea bass research track assessment shifted from this fall into spring of '23. That will be followed by a management track assessment in June that will, if everything is successful, provide management advice and reports to be received in next July.

Also, in 2024 and assessment update was recommended by the Assessment Science Committee for tautaug. I won't read through them, but these are all the proposed changes for the longer term in 2025 and 2026. Notably there was a request last time the Committee provided an update to the Board for a cobia stock assessment.

That has been added as a benchmark through SEDAR in 2025. But that is the full list of stock assessments that have been added either through SEDAR or NRCC, the Northeast process or otherwise recommended by the Assessment Science Committee. If we could just go to the final slide, please.

Just two take-home messages. The assessment activity continues to be very busy, 2022 was I think our business year in the past decade, and there are several species on the horizon. I think the action for today, Mr. Chairman, is to see if you all have any requests or modifications to the stock assessment schedule, and if not to

seek your approval of the Assessment Science Committees recommendations.

CHAIR WOODWARD: Thank you. All right, any questions, concerns about the proposed stock assessment schedule? I don't see any. Chris Batsavage.

MR. BATSAVAGE: Not a concern, but I certainly support considering the addition of weakfish for 2025 for an assessment update. I think the terminal year for the last assessment was 2017, so it's probably good to just get a check on where we are now compared to then, thanks.

RIVER HERRING STOCK ASSESSMENT UPDATE

CHAIR WOODWARD: Anyone else? Any opposition to accepting the proposed stock assessment schedule as presented by Pat? All right, I don't see any, so Pat, consider it approved as presented. Thank you. All right, so I'll go to Dr.'s Drew and Anstead for their update.

DR. KATIE DREW: The River Herring stock assessment is proceeding apace. We just had our data workshop in mid-July, where the TC got together to review the available datasets, and decide on things like the terminal year, as well as a set of terms of reference. Because there was no River Herring Board meeting this meeting, the terms of reference and the Stock Assessment Subcommittee will be approved via e-mail. If you are on that Board keep an eye out. We're still on track to complete this, and present it at the annual meeting in 2023. Happy to take any questions about that.

CHAIR WOODWARD: Any questions for Dr. Drew on that? All right, I don't see any.

EEL STOCK ASSESSMENT UPDATE

DR. KRISTEN ANSTEAD: The Eel Stock Assessment Team has finished the benchmark stock assessment, and it is now in the hands of the TC. We will be presenting the stock assessment to the Technical Committee next week for their comments, edits, and hopeful approval to go to peer review, which

we hope will happen this fall, and then we would bring the assessment to the Eel Board in the annual meeting.

We have developed a delay difference model, as recommended by the previous peer review, as well as addressed some of the other work that the peer reviewers discussed in their last report. We've tried a bunch of methods, and also evaluated the young of the year data, to make some recommendations about where states might be able to cut back, to take away the burden of those surveys, while still maintaining the time series.

WE also have evaluated some index-based methods for setting catch advice, because I know that has been a concern for the Board for a while. How do we set a coastwide cap for eel? We used a Northeast Fishery Science Center paper, and developed one of the methods that they recommended to set catch advice, and I'm happy to take any questions about the process of the Eel Assessment.

CHAIR WOODWARD: Any questions for Kristen? John Clark.

MR. CLARK: Thank you, Kristen. Will the new model be similar to the last one, given I don't think the data has really improved that much, that it will just give us an either depleted or not depleted type of designation?

DR. ANSTEAD: You are correct that we had the similar challenges with the delayed difference model that we had with the DB/SRA. We have developed it. We did develop reference points for it. But the way it stands now, is we're suggesting the index-based methods for sending catch advice, rather than the Delayed Difference Model as it is in its current edition.

But we'll see how that goes through with the TC, the peer review. Maybe there will be some suggestions coming out of that. It is fully developed, so it's available for their

consideration. But I think probably we will fall back on the index methods.

CHAIR WOODWARD: All right, any other questions? Seeing none; thank you both for your reports, I appreciate it.

CONSIDER PROVIDING COMMENTS TO NOAA FISHERIES ON ATLANTIC STURGEON BYCATCH

CHAIR WOODWARD: All right, now I'm going to go back to Toni. Yesterday we had a presentation about the Atlantic Sturgeon Bycatch Working Group draft Action Plan, and were asked if we had any comments on behalf of the Commission. I want to turn to Toni for an update on that.

MS. KERNS: I did receive a request for us to provide comments on the draft Action Plan. This individual wanted to emphasize the improved coordination with the TRT, the Right Whale TRT and their activities ongoing with making changes to the gillnet fishery, and to make sure that the actions that are occurring through the Sturgeon Bycatch Plan is coordinated with the TRTs action, to make sure that we're not taking double action on the gillnet fishery.

In addition, they wanted the letter to convey the Commission and state's interest in planning and conducting the science proposed in the draft Action Plan. You know the Commission is the one that completes the stock assessment for sturgeon, so it feels that it's in our best interest and the state's best interest to work towards the research questions.

Having us do that research is important. I think that was the general gist of it. Jason, I don't know if you had anything in addition to add to Conor's request or not, and if anybody else had any additional requests for a comment on this, I am happy to take them.

CHAIR WOODWARD: All right, Pat Keliher.

MR. KELIHER: I certainly don't have any objections to the TRT component of the request. I am

concerned about the research piece, because I don't know what that means for the states. Without having a better understanding of what that is going to mean from a state perspective, I'm a little leery about agreeing to having that language in there.

CHAIR WOODWARD: What is the timing on this comment letter, I guess is the other question.

MS. KERNS: I'm going to have to talk with Spencer, to see if we have time for an actual letter or if I just need to talk to him about where the Commission's concerns are. Obviously, he heard the concern yesterday, about the overlap of the TRT, so he is aware of that. They are going to be posting the draft Action Plan in early September, to my understanding.

There is not a ton of time to return. I don't think this is an official comment period type of situation, where we have a date that we have to give them comments by. I'll have to check with him on that. I don't know what Conor's intention was on the state's responsibility for the science, so I can't answer that question.

CHAIR WOODWARD: But suffice it to say that certainly we need to make sure that whatever we're putting in that letter is within everybody's comfort zone. Okay, if you want to call on him, yes.

MS. KERNS: Spencer, I have unmuted you.

MR. SPENCER TALMAGE: Hi, thanks folks. I just joined, so I heard the comment about timing. Toni was pretty much right, we plan on getting the final Action Plan released and online, at least ahead of the New England Council meetings in September. We need to wrap up anything that we need to do to make changes to the plan, at least by the last couple weeks of August, in order to get things through review, and to make sure that whatever changes we've made to the Action Plan are acceptable and make sense, and things like that. The

assessment that there is not a ton of time is probably accurate. Unfortunately, the timing of this meeting came out with our schedule and the New England Council meeting in September.

CHAIR WOODWARD: All right, thanks, Spencer. It sounds like we can at least draft up something with the concern we know about, and maybe you can circle back with Conor, or if Jay can inform that.

DR. McNAMEE: Yes, maybe not. I just pulled up the e-mail and kind of reread it. I think his intent was just, thinking about it now, you know the concern of, are you asking us to do anything? I don't think that was necessarily the intent, but just to involve the states directly, since the Commission is the one that does the assessment, and they're talking about areas in our state waters or in proximity to them that we should be informed. I think that is all he meant, not sort of obligating us to any sort of work. Hopefully that helps.

CHAIR WOODWARD: Does that increase your comfort level over there, Mr. Keliher?

MR. KELIHER: Yes, I don't have to take any extra blood pressure medicine, Mr. Chair, I'll be good.

CHAIR WOODWARD: Well, your health, mental and physical, is always in the forefront, as it was when I was Vice-Chair. All right, well it sounds like we at least have something that we can build on that we're comfortable with.

MS. KERNS: I'll touch base with Spencer offline, to see if the timeline that I think it would take us to get a letter together does not work with what he needs, and if he and I just need to talk through what our major concerns are for them to address, prior to them meeting to posting for the Council meeting.

CHAIR WOODWARD: All right, thanks, Toni.

REVIEW OF BLUE CATFISH SCIENCE IN CHESAPEAKE BAY

CHAIR WOODWARD: Our next agenda item is Review of Blue Catfish Science in Chesapeake Bay. I

think we have; this is a two-person presentation. I think the third person is not going to be available. We have Mandy Bromilow, and Christine Densmore. I'll turn it over to you.

MS. MANDY BROMILOW: Thanks, can you all hear me, okay?

CHAIR WOODWARD: Yes, go ahead.

MS. BROMILOW: First, I just want to thank you all for inviting us to speak today. My name is Mandy Bromilow. I'm the Fisheries Specialist at the NOAA Chesapeake Bay office, and I also coordinate the Invasive Catfish Workgroup. Today I'm going to talk a little bit about who is in the workgroup and how we're trying to combat the issue of invasive catfishes. I should note that the Workgroup is not solely focused on blue catfish, as many people talk about. But we are also concerned with flatheads. Again, the majority of the attention and work is placed on blue catfish at the moment. But the flatheads are more of an issue in our upper tributaries, and up in Pennsylvania. The Invasive Catfish Workgroup is a large, multi-stakeholder workgroup within the Chesapeake Bay Program. We have members ranging from North Carolina to Pennsylvania, and they include not only managers, but folks from other state and federal agencies, nonprofits, academic institutions, as well as industry, including both commercial and recreational fisheries and processors.

This stakeholder diversity is very intentional when we were putting together the workgroup. We wanted to make sure that the interest and perspectives of everyone involved in the issue were representative within the group, in the hopes that we would come up with some collaborative solutions that would meet the needs of many stakeholders.

The Workgroup first met at a workshop in January of 2020, to discuss the issues and talk about some strategies for dealing with them.

Those discussions at the workshop resulted in a Chesapeake Bay Program management strategy for invasive catfishes. At the workshop the Invasive Catfish Workgroup identified two primary objectives.

First to reduce the abundance of invasive catfish in the bay, and second to mitigate the spread and ecological impacts to the ecosystem. Management strategy lays out four approaches for addressing these objectives. The first approach is to increase public awareness, not just that these fish are invasive and have negative impacts, which is obviously an important aspect of this issue.

But we're also letting people know that blue catfish are a tasty white fish that are great to eat, so we want to get more people interested in eating blue catfish, in order to improve the market, and hopefully the fishery. The second approach is to remove processing barriers. Currently the USDA requires inspections during processing operations, and this increases cost and puts extra burden on the processors.

We want to remove the barriers, particularly for those wild caught catfish in the Bay, and try to get more people into the fishery. The next approach is to continue conducting and synthesizing research. There has been a lot of great work that's been done on invasive catfishes in the Bay. But we still have a lot of data gaps when it comes to their biology and ecology, and particularly their population dynamics in the Bay.

We have some other really important questions that we need to address, however, to effectively manage them. Finally, we recognized at the workshop that each tributary is very different. Each tributary is at a different stage of invasion, and there may even be different fishing interests across the tributaries.

Our final approach is to develop, we'll call it tributary-specific management plans. To organize the Invasive Catfish Workgroup for action, we developed three subcommittees to focus our efforts. The Outreach and Marketing Committee

has been working with partners to develop fact sheets and public perception surveys. They are attending public outreach events like seafood festivals and expos, and they are generally trying to get the word out about those big impacts of invasive catfish, and get more people interested in eating them. The Science and Research Synthesis Committee has been compiling a lot of the information from previous studies, and identifying available sources, to better understand what we already know, and what resources we have for future studies. They're using that information to identify and address knowledge gaps. Some of the work that our members have done include diet studies, to quantify impacts on other species, and studying the current studies to assess their potential to spread.

The Tributary-Specific Management Committee is focused on cross-jurisdictional coordination efforts, to develop catfish fishery management plans, or at least incorporate some language of invasive catfish in their existing fishery management plans. They are working to make sure that management is a bay-wide, or even a watershed-wide effort.

They are also helping to develop an invasive catfish data hub and map, where we can keep up to date on information, so the areas where blue and flathead catfish have been found in the Bay, and sort of harvest numbers in the different tributaries, and things like that. That's a super brief overview of the Invasive Catfish Workgroup.

But as I'm sure you know, there is a lot more to this issue, there are a lot of different sides to it. If you want to learn more about the workgroup and what we're doing, you can e-mail me. My e-mail is up on the screen at mandy.bromilow@noaa.gov, or you can visit the Invasive Catfish Workgroup webpage on the Chesapeake Bay program website.

The website also has the management strategy and all the minutes from previous meetings, if

you are interested in those details as well. But that's all I have for the overview, so let's turn it over to Christine to talk a little more about the research that the workgroup has been doing.

DR. CHRISTINE DENSMORE: Okay, thank you, Mandy, and thank you everyone. I am Dr. Christine Densmore, I'm a veterinary medical officer with the Eastern Ecological Science Center with USGS. I'll just to kind of follow what Mandy was telling you, the broader scheme of things with the Invasive Catfish Workgroup.

I wanted to give you kind of a more closeup of a small piece of the work that's going on, some of the newer work we're doing for research and support of the management of blue catfish across the area. Again, I am with USGS, but this is a multi-agency effort that we're doing. A lot of this in some of the southern tributaries, and now moving into some of the northern. The blue catfish have moved north, the research has gone along with it also.

First, I guess the triple arm of things that we're doing within USGS right now, with the Eastern Ecological Science Center. First of all, we're looking at diet of blue catfish around the area, and this work that are evolving in USGS is largely just in support of our partner agencies and organizations that are doing diet-based studies.

The main one I'll be discussing today is Salisbury University in Salisbury, Maryland, on DelMarVa. They are working on looking at blue catfish diet in the Nanticoke River. Mary Groves, who couldn't be here today with Maryland DNR, has done that as part of their scope of work looking at blue catfish influences on the Pawtuxet River in Maryland. With the diet portion of this study on the Salisbury, we're also working with Maryland DNR Brett Coakley on that part of the study on the Nanticoke River, as well as Johnny Moore and his team in Delaware DNREC. Elsewhere I'll be talking about things we're working with Virginia Commonwealth University on some of their help for perspective things we're doing, and UMCES Appalachian Lab is involved in some of the molecular analyses for diet that we are doing also. Again, diet is the first arm of this.

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Health and Disease, looking at other potential impacts through, just kind of cohorts, just other fish in the area, what could they be passing back and forth. What type of health ramifications are there, not only among blue catfish populations, other catfish populations, and you know other fisheries or sources?

We're also looking at reproduction and spawning behavior. Again, as Mandy mentioned, you were looking at kind of a tributary-specific basis as we're doing this research, because tributaries vary so much throughout the Chesapeake. Now we're moving this work that has been done a lot in some of the further southern tributaries in Virginia areas, and moving this a little north into the Nanticoke.

Okay, here is a nice, gross slide for you all just before lunchtime. In talking about what we're seeing on the Nanticoke River, this is just kind of a sampling of some of the preliminary results we've gotten so far. Again, the Nanticoke work is largely being done as a study through Salisbury University with support of USGS, Maryland DNR, and Delaware DNREC.

Dietary impacts of blue catfish on other resources are pretty high on the list of concerns of management agencies for good reason. They are nonselective feeders, omnivorous, transitioning to a more piscivorous diet as they grow larger. There is a lot of this work that has been done assessing diet and potential impacts on fisheries resources in the Virginia tributaries further to the south.

Again, as the fish are moving north, we're transitioning some of this to the north. Mary has done a lot of this on the Pawtuxet River, and now we're looking at the Nanticoke. Here is just again a sampling. This is preliminary, because the work that Salisbury is doing is going through the end of 2022, so we only really have the first half of this study in right now.

But you can see there are a variety of types of critters there, again nonselective feeders. We're finding a lot of detritus and plant matter in stomachs. We're finding some things we really can't identify as yet. Hopefully the molecular analysis we're doing to kind of buffer the study will help that also.

But we are finding clavicular clams. They are going after Asian clams also to a good degree. Blue crabs are in there a little bit. That one in the upper left is a hog choker. Then a few of the other species again unidentified right now. Data collection is ongoing, and will be through the end of this year.

This slide pretty much exemplifies that what we're seeing so far is consistent with what has been reported in other tributaries that these critters are fairly nonselective and they'll go after what's there. I'll also note in the middle in the top there, thought you may not be able to see that too well from the back. But those are actually corn kernels in the guts of that specimen there. We think that fell off probably a barge in the Nanticoke River, so again, very opportunistic in their feeding behavior throughout. Here again is some of Zach Crum, the graduate student's preliminary data. He has this laid out here as percent weight, of course he's also looking at it by frequency of occurrence, and a few other metrics also, and this is based on just the 218 positive stomach samples we have so far through May.

Also, note on this again, it is preliminary. We will have some molecular data to back this up for some of the unidentified species later on. They're also going to be doing some stable isotope work to further trophic relationships in blue catfish from the Nanticoke River, comparing with other species.

Based on what we're seeing so far, again, we're seeing a lot of consistency with what has been reported for the more southern tributaries. We're seeing a lot of detritus and plant matter in the gut. We're seeing white perch, as far as a large makeup of both percent weight and frequency of occurrence. We're seeing a lot of gizzard shad.

To a lesser degree there is some unidentified alosine species, and some that they have identified. I think it was a blueback herring in there, and I think an alewife from some of the reports that Zach has given with us so far, and the occasional blue crab, even in the Nanticoke. To be continued, once this work should be wrapping up toward the end of calendar year 2022, and hopefully coming to fruition in about a year from now.

One other thing I thought you might find interesting, just related to diet is, one of their more interesting findings from this past year was the remains of an adult wood duck in the stomach of one of the larger catfish specimens. You can see there on the left-hand side of the slide a lot of the feathers and the actual bill of the duck that came out of that.

Yes, they'll eat what's there. Okay, just a quick overview of some of the other things with my laboratory and my background as a veterinarian. Of course, we're interested in health of critters across tributaries, and invasive species of concern, because of what they may be bringing with them, what may be disseminated along with them to other native species, or other important resources.

What we are doing is working across three different tributaries. We're working with VCU in the James River, we're working with Mary Groves and her crew in the Patuxent, and then with these folk in the Nanticoke right now. Just to get some idea of what we consider normal health status, both grossly and histologically, so on a microscopic scale. What are we seeing, as far as the health of the tissues, what type of parasites might be there as a normal abnormality, as you see that on the lower left there?

That is a myxosporean from the gill of blue catfish we're finding throughout all three tributaries we're examining. We're looking a little further into that to try to speciate it, and perhaps even see where it is in some other

catfish in the region. What might be the implications of something like that? Above that is an unusual case that we saw last fall, actually the Salisbury University folks picked this up working, when we're seeing these kinds of cystic blister-like lesions on the exterior of the catfish. They kind of came and went in late fall, haven't seen them since, wondering if we'll see them again later this year. We have no actual ideology identified for them right now, but we are still looking and prepared to look a little harder if they do occur again in the fall. Yes, we're going to look and see what is normal across the tributaries, and what implications there might be.

Again, for not only the blue catfish population, but for health and disease of other species, as well as any potential human health implications there might be, that we're going to do a little bit of microbiology along with this, just to see what type of pathogens they might carry, and if any would have any human health significance for a fish in a developing fishery in the region.

This one, sorry the text isn't coming through on there very well, but this is just another example of something that is an unusual health presentation that we saw, just from folks that had been out fishing, with this type of hemorrhagic lesion around the face and the mouth. This was off Barren Creek in the Nanticoke River.

We are working to identify, actually to confirm the identity. We think we've identified a bacterial pathogen. It's a little unique to find in catfish, so again, we're kind of interested in the implications of this for not only catfish health, but for other types of aquatic animals in the region.

Again, that type of thing that we're considering as we're looking into health within this species in the area. The final arm of this is the reproductive biology that we're looking at, more in the Nanticoke River right now. Again, there has been some work done on reproductive biology by the folks at VIMS, further south in some of the Virginia tributaries.

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But we're taking another look at it in the Nanticoke, just to compare reproductive staging and gonadal histology, so looking at it on a microscopic level. At the same time doing some blood plasma sampling, looking for estradiol and calcium levels in the females, as indicators of spawning and of basically the annual cycle of reproductive hormonal change, and seeing how that correlates with what we're seeing in the actual gonadal development.

Yes, we're looking at it through seasons, as we're collecting for the diet analysis, we're also collecting for blood sampling and gonadal sampling. That is in process right now, so what we have here is some preliminary data, showing what we've seen in some other tributaries, what we're seeing basically a trend towards spawning peaking in the May to July area, and we had that the highest levels that we saw last time in June.

We'll see how it continues as this unravels, as the year goes on, and we collect the rest of the data, looking at how this compares from the Nanticoke to some of the other tributaries, and what consistencies and inconsistencies there may be. I think that's it. Again, that was just a whirlwind tour of some of the newer research that's going on in the blue catfish community.

As you all are probably aware, there is quite a large body of research that has been more concentrated, again in the southern part of the Bay in the Virginia tributaries, and as the fish have moved. As in keeping with the aims of the Invasive Catfish Workgroup, for looking at tributaries specifically for management. We're aiming to do the same thing with these southern tributaries a little further north. Now, Mandy and I are happy for any questions or discussion points you all may have.

CHAIR WOODWARD: Thank you all very much for that presentation. It's an annoying and also interesting predicament, you know when you have to deal with things like that. I've got John Clark and Bill and then Jay.

MR. CLARK: Thank you for the presentation, Christine. The Nanticoke there, I know just from some of the trawl sampling we've done. The biomass of blue catfish now is absolutely staggering. I just can't believe how quickly they've reached this huge amount of biomass. I was just wondering, A, are you seeing cannibalism among them?

Because some of the trawl we bring up there is nothing else there except the blue catfish, from this size up to you know the ten-pound size, and we've had several new state records for catfish set, just in the past couple of years with blue catfish. Then second, I noticed you did have shad as one of the dietary items. We do have a shad hatchery on the Nanticoke, and I'm just wondering if we're spending all this money just to feed blue catfish.

DR. DENSMORE: Hopefully not. To answer your first question, yes. We are seeing some evidence of cannibalism there. On the Nanticoke they have reported blue catfish in the stomach so far. Secondly, yes, and actually I've been at that hatchery for working there on site with Johnny, so that is a great place.

It was central for where we were working up the fish. I hope not. What they have found in some of the work that's been done, I think by Joe Schmidt and the folks out of Virginia Tech in the southern part, is while some of the alosines have been found as contents, they haven't represented a huge, huge amount of that.

But they made a cautionary note in that too, of course it's going to be very density dependent; it's going to just depend on how things go. They are not one of the, I guess the top things that we found so far. Again, on the Nanticoke that is all preliminary. We'll have to wait and see how this all washes out later on, but they are there, but they are not there in as huge a quantity, gizzard shad much more so than the other alosines, I think so far.

CHAIR WOODWARD: All right, Bill Hyatt.

MR. HYATT: Yes, just a couple of quick questions. The first one that comes to mind, what is known, understood or maybe speculated about the cumulative impact of the different invasive species, in addition to the blue cats and the flat head cats in the area? I'm asking that because oftentimes you look at, like for example the diet of a single invasive species.

You don't see the full picture. You don't see the full picture, because you're not seeing the other invasive species layered on top of it, and sometimes you're not seeing the dietary shifts that are forced onto native predators, in order to develop a real understanding of a cumulative impact that it might have. That is the first question, and I guess speculative is probably where you might have to go with that. Then the second one is, I thought I saw in the report some mention of there being a canal or water connection between Chesapeake and parts of the Delaware Bay system. I'm wondering what preventative methods are in place or contemplated. (Faded response from unknown person) Okay, so only one question.

DR. DENSMORE: Okay. I wish I had an answer for you. I actually don't. I think that's an excellent question, as far as the cumulative impacts, and certainly something we could be looking at a little harder. Something else to consider with blue catfish. The more we tend to get into the dietary analysis is, they don't seem to be quite the apex predator we had once feared.

That's not to say they are not going to have impacts. Certainly, in the density of the numbers they have, you can anticipate that is a good possibility. But they are more of I guess a mesopredator, as far as again, this paper by Joe Schmidt and his colleagues out of Virginia Tech had examined this in some of the Virginia tributaries, and found just the amount of plant matter, the amount of detritus, the amount of invertebrates and other things there.

Some of the, I guess fish species that aren't as much of interest from a managed resource perspective, tended to be a little bit higher in fact than other items. Yes, when you look at them kind of in conjunction with the flathead catfish, the northern snake at some of the other priority invasive fish species in Chesapeake.

That is a great question, as far as what overall might they be doing kind of cumulatively for individual species. I think, and again it just may depend a little bit too on where your focal point is, because that's the whole reason for the tributary-specific management that we're looking to in the Invasive Catfish Workgroup is, it is going to vary tributary by tributary.

CHAIR WOODWARD: All right, Jay.

DR. McNAMEE: Actually, I'll start with, and just to be clear I mean this as a biologist as a compliment. You win the award for most gross pictures in a presentation. Well done! I had a question about some of the diet work that you guys are doing. You mentioned some molecular techniques, and so I'm assuming the molecular techniques can ID species.

But can you also tell the contribution to that gut, like the proportion that unidentified species is in the gut. This idea comes up a lot in the context of ecosystem management, because we work with a lot of diet information, and that is kind of something I've been wondering about, if the molecular technics are that good yet.

DR. DENSMORE: First of all, thank you. As a veterinary pathologist, yes, a gross picture is a plus. I take that as a compliment, thanks. Secondly, yes. For the molecular analysis we are looking at some gene sequence analysis. We're working with, again the folks out of UMCES to help us with this long pipeline of processing

Then turning this around with bio informatics, to take these gene sequences and tell us what species that we cannot identify, because it is so gross, that they may be having in the stomach.

For that, as far as looking at proportions. I think, and again I have to apologize, because it's not my specialty, as far as the diet analysis thing. I think them looking at it through both percent weight and frequency of occurrence, helps get to some of that information, as far as how much is there.

Individually, when we're looking at the molecular for the purposes of this study, we're looking at samples from individual specimens that we just can't identify grossly. We hope to just get one answer back that this is a sequence from, you know a blueback herring or what have you, as far as that.

Again, something else they are doing to get to more of a broader trophic interaction answer for the Nanticoke River is that the Salisbury University folks are going to be doing some stable isotope work along with that also, so they are collecting some fishery samples from the blue cat fish specimens, as well as from some of the other native and some other nonnative species that we're encountering in the area too, to do some stable isotope comparisons.

CHAIR WOODWARD: All right, Eric.

MR. REID: Thank you for the presentation. I just have a quick question about one of your bullet points. What are the processing barriers, is it regulatory or is it the fish itself?

MS. BROMILOW: Yes, so the barrier is really just that inspection requirement that I had mentioned. Essentially, they need to have an inspector in the processing area. It's a matter of having to pay folks to work overtime, to stay there for when they're doing the processing, and then they also have to, it's overtime and then it increases the cost and the burden on the processors.

It actually was such an issue that there were even more like smaller processing operations in the Bay that stopped processing catfish because

of that inspection requirement. It was just too much. It wasn't worth having to go through that inspection requirement and the cost and all that to continue to process catfish.

Now we're down to like a few major operations that are doing it. I know it's also been sort of a burden for some of the fishers as well, because they had to work, or collect fish and like turn it in at a certain time, but it wasn't when the processor was there it sort of messed up the whole operation.

It's really just that inspection requirement for catfish that we're trying to work through somehow, but again, it's just more of a political thing, so we haven't really been able to do anything specifically as a workgroup to get through that. But we do have folks, like we have processors and other folks on the workgroup that are trying to provide information for folks who can lobby for that change.

CHAIR WOODWARD: All right, Eric.

MR. REID: Yes, I'll be brief, Mr. Chairman. Yes, I would like to talk to you about that a little bit, because it doesn't make any sense to me. I'll give you a call offline, to save everybody. Thank you very much.

CHAIR WOODWARD: I think Lynn or John, to that point.

MR. CLARK: Go ahead.

MS. FEGLEY: Thank you, Mr. Chair. I just wanted to clarify a little bit from what Mandy said, and Marty can help, but this is a federal requirement, it's incorporated into the Farm Bill. If I understand, it was put in place. It was aimed at catfish processors in the south, but this is an unintended consequence of a federal piece of legislation that we're trying to work through.

MR. REID: This is a USDA thing?

MS. FEGLEY: Yes.

MR. REID: Oh, God help you, that's all I've got to say.

MS. BROMILOW: I was going to mention, actually, Maryland Congressman Harris put in some new language in that, some catfish language in the Appropriations Bill for the House. That would essentially transfer that inspection requirement to the FDA. It would basically give the processors a waiver for wild caught blue catfish in the Bay, so that was a potential solution, at least to start with helping remove that processing barrier in the Bay. I'm not sure where that has ended up at this point.

CHAIR WOODWARD: All right, I'm going to go to Loren and then to Pat Geer.

MR. LUSTIG: Thank you for that fascinating report regarding rivers that I have personally have enjoyed, including the tidal area of the Patuxent River. About 40 years ago, I remember doing recreational fishing for channel catfish there, and really enjoyed it. Do the blue catfish displace the channel catfish when they arrive?

DR. DENSMORE: Yes, I'm not sure about that, but I'm seeing some nods from around the room, so.

MR. PAT GEER: The answer is yes.

MS. BROMILOW: Yes, I was going to mention that. They have seen sort of a competition with white catfish. As blue catfish have increased in their abundance, white catfish have decreased. But I haven't actually heard about channel catfish impacts, but it sounds like other folks are aware of that.

CHAIR WOODWARD: All right, Pat Geer.

MR. GEER: Yes, I'll try to wrap this up, because we could talk about this all day, between the three of us. In Virginia we have a unique problem that our freshwater fisheries agency has developed a world class trophy fishery for

this. It's multi-million dollars, people come to the James and catching 90-to-100-pound fish.

However, the biomass of the subadults is so large, that it is starting to stunt the growth, it's affecting its trophy fishery. They've asked us, they've come to VMRC and asked us, how can you increase your commercial harvest. We've come up with some ideas. We're trying to work with them on that.

Getting back to Bill's concern about predation on other species. Mary Fabrizio just finished this study for us that found that in a small area on the James, about 200 kilometers, the blue cats were eating 2.3 million crabs. If anyone knows, in the Chesapeake Bay we're having problems with blue crabs right now.

There are impacts, there are also impacts probably potentially to striped bass, because these fish are in the nursery grounds as well. As you said, they eat anything. They'll eat anything that they can get a hold of. But further down a lot of the studies that have been done in fresher water, but Mary's study was in the meso area, which was between, I think 6 and 15 parts of 1,000. It is a problem we could talk all day about this if you want.

CHAIR WOODWARD: Thanks, Pat, and thank you Mandy and thank you, Christine. Like I said, it's an intriguing and vexing issue, and we appreciate the presentations.

REVIEW OF NOAA FISHERIES DRAFT EQUITY AND ENVIRONMENTAL JUSTICE STRATEGY

CHAIR WOODWARD: All right, at this point I'm going to go to Sharon Benjamin for a review of NOAA Fisheries Draft Equity and Environmental Justice Strategy.

MS. SHARON BENJAMIN: Hi there, can you hear me?

CHAIR WOODWARD: Yes, we've got you loud and clear.

MS. BENJAMIN: Wonderful, thank you. Sorry, I don't have such fabulous fish photos in my presentation. But I really appreciate you having me, thank you very much. My name is Sharon Benjamin; and I am a NEPA Policy Analyst in my day job at the Greater Atlantic Regional Fisheries Office in Gloucester. But today I'm here to share some background on this NOAA Fisheries Equity Environmental Justice Strategy.

It's a draft strategy that we've been working on for a few months, and I really appreciate the chance to share it with you and members of the public tuning in. Today I'm looking to share some background on the working group that wrote the strategy draft document, and explain some of the equity and environmental justice mandates that we're working under, and that motivated the formation of this working group.

I can provide some context on how the strategy was developed, and how it's framed out, and I'll wrap up with some information on how you can provide feedback if you would like. This is great, this is the right slide. As I said, well this working group was launched in response to the Executive Order signed in January, 2021, the EO 13985, which is the Advancing Racial Equity and Support for Underserved Communities through the federal government's executive order. The Working Group is comprised of staff representing each of the Science Centers, Regional Offices, and Program Offices, such as the Highly Migratory Species Office. As I mentioned, this group was launched in response to the Executive Order 13985.

This work has come about because we're newly motivated with this executive order, and another executive order to take a closer look at how we can achieve equitable outcomes through our work, with these executive orders listed here. The first one, as I mentioned, and the second is 14008, which is tackling the climate crisis at home and abroad.

We've actually been doing work incorporating equity and environmental justice for a long

time, because it's the right thing to do, and we've been working under several mandates, including the 1994 Executive Order related to environmental justice. Several of our mandates that we work under normally, such as the Magnuson-Stevens Act, Endangered Species Act, the Marine Mammal Protection Act, all have elements of environmental justice in their mandates, and how we do our work.

We've been doing this for a little while, but this is a new fresh take on what we're doing and how we can make it better. I just wanted to take a moment here to highlight key terms. I don't have a different slide for it, but the three terms that are mentioned in these executive orders. The first is underserved communities, and that term describes groups that have been systemically denied opportunities to participate.

These are geographic communities, and populations that share a particular characteristic, including for example, women and girls, black and indigenous populations, LGBTQIA plus individuals, and others who fit that category. The next term is equity, which is the consistent and systemic fair treatment for everyone, including those who belong to underserved communities.

Then finally, the last term is environmental justice, which is the fair treatment and meaningful involvement of all people. Simply put, we want to ensure both equal access to benefits, as well as equal protection from environmental harm and hazards for all communities. That is a quick rundown of those terms. I'm trying to move quickly.

As I mentioned, we launched the Working Group in spring 2021. We developed it with some input we solicited from federally and non-federally recognized tribes, territories, and indigenous communities in November, 2021, and went through an internal review process. The big red arrow points to where we are now, which is looking for public feedback on this strategy document. We rolled it out publicly in May, and we are accepting comments and feedback through the end of this month, August 31.

These minutes are draft and subject to approval by the ISFMP Policy Board.
The Board will review the minutes during its next meeting.

We're hoping this fall to take in all the feedback incorporated, improve the document, and publish a final EEJ strategy by the fall, and by spring 2023, we hope to be able to incorporate elements of these strategic goals into each regional offices operating plan. Here is the meat of it. This is where it gets more interesting. I wanted to explain how the strategy is framed out. To achieve equity and environmental justice in our work, we serve a diverse array of communities, and we realize not all communities have equal opportunities and access to our services. To get there we have three overarching goals. The first is the meaningful involvement of all underserved communities, and that includes identifying them, ensuring equitable treatment, and engaging them meaningfully in our work. The second is the equitable delivery of services, and the third is prioritizing EEJ work in our mandated mission work.

The strategy is going to require step down implementation plans, as I mentioned. These will be tracked with annual progress reports, and we hope this is going to really help us make improvements in our work in six core areas. You can see there is an overarching goal of creating and empowering environment. This is referring to making it realistically possible and truly practically possible to help NMFS staff, NOAA Fisheries staff accomplish these goals.

That means meaningfully integrating EEJ into our day-to-day work, with institutional support such as training, resources, things like translations services, things that make it possible to improve our EEJ work. Then the five goals under that, I'll go through them briefly. The first is policy, which is referring to incorporating equity environmental justice into our policies and plans, and thinking about for example, what additional flexibility we can provide in our policies, to incorporate local language and customs, for example, to help make these programs better.

The second is research, and for instance this includes identifying underserved communities, addressing their needs, and assessing the impact of management choices on them. For example, we could improve this by surveying, to understand barriers to entry in things like fisheries and the aquaculture industry, and through that, identifying potential policy changes to address that.

The next is outreach, which includes for example, building relationships with underserved communities. We're hoping that we can find ways to engage underserved communities through outreach, such as with mentorship programs. For instance, training programs that might navigate a permit application process for grant programs, or a grant proposal process.

The next is benefits, and we're hoping to achieve an equitable distribution of benefits. An example of this is assessing our grant programs, our projects and disaster declarations, and assessing anywhere our funding is going to ensure that it's reaching underserved communities. Finally, for inclusive governance, this is trying to reach an inclusive access to the decision-making process.

One example is having the hybrid meeting style is one way to ensure virtual participation. Why am I sharing this today? I wanted to update you on this effort that NOAA Fisheries has undertaken. We're also requesting feedback. We're looking for feedback from you and from the public, if possible, by the end of the month.

Some of the things we can think about, some example questions you might consider, when thinking about this document is for example, who are our underserved communities, and how can we better communicate with them. We want to improve this document to make it as strong as possible, as we implement it in our day-to-day work.

This slide, so I provided a couple of pieces of material ahead of the presentation to Toni, just to provide the strategy itself, a PDF of the strategy, some frequently asked questions, and links to those

materials. But if you didn't see that or you don't know where those are, that's okay. This slide I put together to try to make it easy to find the materials quickly. If you go to [fisheries.noaa.gov](https://www.fisheries.noaa.gov), and search EEJ in that search tab where there is the orange. It didn't quite format correctly, so I apologize for that. But if you search EEJ, the third link that pops up is where that red arrow is pointing to the NOAA Fisheries invites public comment link, and you see the nice picture of the family fishing together.

That page gives you access to the EEJ strategy. It gives you executive summary translations into several languages, including Chinese, French, Haitian, Hawaiian, Portuguese, Spanish, and several others. There is also a link to the comment form, where we're hoping folks will consider providing feedback.

If all else fails, please feel free to e-mail me. Again, my name is Sharon Benjamin, and you can e-mail me at sharon.benjamin@noaa.gov, and I would be very happy to answer any questions by e-mail, or if we have time, I will do my best to answer them today. We can leave this slide up, and thank you again for your time, and I'm happy to take any questions. Thank you.

CHAIR WOODWARD: Thank you, Sharon, any questions for Sharon. I don't see any hands raised yet, so thank you for the presentation, and thank you for providing us with the information to follow up on this. We appreciate it.

MS. BENJAMIN: Thank you so much, thank you, have a great day.

CHAIR WOODWARD: Yes, I guess a question for those who are left in the room and conscious is, do we want to comment as a Commission or is this something that might be left to individual states, agencies, individuals, so forth, so on? I'm not sure how we would necessary coalesce everybody together as a Commission

comment. I mean you all know your own backyards better than the Commission does. Just a question. Dan.

MR. McKIERNAN: I suspect many of our states have similar initiatives, so it may be difficult for us to say sign on to a letter that is not aligned with our state policies and initiatives. But that is just one thought.

CHAIR WOODWARD: All righty. Well, we are at the end of our agenda, we have no noncompliance findings, thankfully, and we'll have no need for a Business Session, but we do have one other matter of business, and I want to call on Toni, and this is a very important matter of business.

MS. KERNS: Thank you, Mr. Chairman. Maya has been the master behind the screen, the voice of God from above this week. She couldn't make it in person. I'm sorry to say that, because this is Maya's last week with the Commission. She has accepted a spot at the University of Maryland Center for Environmental Science Master's Program.

We are super excited for her to be joining that team. Perhaps she'll work on some spot project with Mike Wilberg or Jenny Nesslage, and be coming back to the Board to present her findings, we don't know. But Maya has been just an instrumental support of so many of the Commission's programs, for me personally, and the ISFMP team. We are so grateful for all of the work that she does for us. I know the Science Team is incredibly grateful as well, and you know working under Tina as the Communications Director, Maya has been instrumental in pulling together the story maps that the Commission has produced over the past couple of years.

Then I don't know anybody that can take motions as well as Maya does. I am so sad to see her leaving us, but really excited for her. Maya, we wish we could send you off in person, but you know thank you again for all that you've done for us over the years. (Applause)

CHAIR WOODWARD: Yes, thank you, Maya, and we wish you the best as you go forward into a graduate

program. As Toni said, we might just cross paths again one day. Maybe not some of us who are a little longer in the tooth, but some of the other ones.

ADJOURNMENT

CHAIR WOODWARD: All right, is there any other business to come before the Policy Board? I do not see any, any objection to adjournment? Don't you dare! I do not see any, so we will stand adjourned. Thank you, and I look forward to seeing everybody in New Jersey.

(Whereupon the meeting adjourned on
Thursday August 4, 2022 at 1:15 p.m.)

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Fish Habitat of Concern Designations for Fish and Shellfish Species Managed by the Atlantic States Marine Fisheries Commission

Month XX, 2022

Prepared by the ASMFC Habitat Committee and Habitat Program Coordinator

Introduction

The Atlantic States Marine Fisheries Commission (Commission or ASMFC) serves as a deliberative body that coordinates the conservation and management of the Atlantic coastal states' shared fishery resources for protection and sustainable use. The Commission's Habitat Committee functions to promote and support cooperative interstate conservation, restoration, and protection of vital habitats for Commission-managed species. One of these functions includes the development of recommendations for Habitat Areas of Particular Concern (HAPC) for each species. The Commission renamed HAPCs 'Fish Habitats of Concern' (FHOC) in October 2017 to distinguish the Commission term from the federal term defined by the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson Act). FHOCs are a subset of fish habitat that are particularly ecologically important, sensitive, vulnerable to development threats, and/or rare. FHOCs are defined based on the same criteria as federally designated HAPCs, but since species managed only by the Commission do not fall under the Magnuson Act, their habitats are not afforded federal legal protection and no consultation with the National Marine Fisheries Service (NMFS) is required. Defining HAPC and FHOC for federally- and Commission-managed species, respectively, is intended to focus conservation efforts on specific habitats that are most ecologically important, vulnerable, and/or necessary to support each life stage of a species.

Goals

This report has two primary goals:

1. To describe the regulatory and policy context for habitat descriptions in Commission Fishery Management Plans;
2. To draft text descriptions of FHOC for species managed only by the Commission, plus Atlantic sturgeon. Atlantic sturgeon management will become the responsibility of the Commission once it is declared recovered. Given that the Commission wishes to affirm NMFS's designation of Critical Habitat (CH) for the species, the Habitat Committee elected to include the species in this document.

Commission Policy on Habitat Descriptions in Fishery Management Plans

The Commission recognizes the importance of habitat conservation as a critical component of fisheries management and that thriving habitats produce abundant fish populations. While the Atlantic Coastal Fisheries Cooperative Management Act does not grant the Commission regulatory authority over habitat of Commission-managed species, the Commission does require habitat descriptions be included as part of each Commission Fishery Management Plan (FMP) in recognition of the critical role habitat plays in fisheries production and ecosystem function.

Guidance and process for the development of habitat sections to be included in FMPs is outlined in the ASMFC's [Habitat Committee Guidance Document \(2013\)](#).

The basic elements of an FMP's habitat section include:

1. Description of the Habitat;
2. Identification and Distribution of Habitat and HAPC (*since re-named FHOC*);

3. Present Condition of Habitats and HAPCs (*since re-named FHOC*);
4. Recommendations and/or Requirements for Fish Habitat Conservation/Restoration; and Information Needs/Recommendations for Future Habitat Research.

This document focuses on designations under Section 2: Identification and Distribution of Habitat and HAPC (*since re-named FHOC*), and under Section 3: Present Condition of Habitats and HAPCs (*since re-named FHOC*) where appropriate.

Commission-managed species are not subject to requirements imposed by the Magnuson Act which mandate designation of Essential Fish Habitat (EFH) and evaluation of federally-permitted projects that may impact that habitat¹. However, the NMFS and U.S Fish and Wildlife Service (USFWS) do have obligations to consult on a broader array of trust resources under the Fish and Wildlife Coordination Act, which includes Commission-managed species.

Guidelines for Identifying Fish Habitat of Concern, formerly known as HAPCs

The Commission's guidelines for identifying FHOCs (formerly HAPCs) in FMPs are stated in the box below. The subsections were combined to create the current designations.

The text is taken from Appendix 3 to the Habitat Committee Guidance (2013, pp. 30-31). *Note: "Habitat Area of Particular Concern" has been changed to "Fish Habitat of Concern" in the text below where appropriate.*

1.4.1.2: Identification and Distribution of Fish Habitat of Concern

The intent of this subsection is to identify habitat areas or [fish] habitat area of concern that are unequivocally essential to the species in all their life stages, since all used habitats have already been identified in Subsection 1.4.1.1.

*Habitat Areas of Particular Concern, or HAPCs, are areas within EFH that may be designated according to the Essential Fish Habitat Final Rule (2002) based on one or more of the following considerations: (i) the importance of the ecological function provided by the habitat, (ii) the extent to which the habitat is sensitive to human-induced environmental degradation, (iii) whether, and to what extent, development activities are, or will be, stressing the habitat type, or (iv) the rarity of the habitat type. Descriptions of EFH are not currently being included in FMPs prepared for species solely under Commission management. The definition of FHOC is therefore modified to be areas within the species' habitat that satisfy one or more of the aforementioned criteria. **When an FHOC is described for a species solely under the management of the Commission, the designation does not have any regulatory authority. Please refer to the ASMFC HAPC document for a list of species under Commission management only and description of the corresponding HAPC (ASMFC 2013b)**².*

¹Federal agencies proposing or authorizing projects within EFH areas are required to consult with NMFS to determine the impact of those projects on EFH. This EFH consultation is required only for federally managed species, not for species solely under the management authority of the Commissions. Regulatory guidelines for EFH consultations can be found at 50 C.F.R. §600.905 2015.

² The referenced document is referring to this current document (ASMFC 2022).

A FHOC is a subset of the “habitats” described in Subsection 1.4.1.1, and could include spawning habitat (e.g., particular river miles or river reaches for striped bass populations), nursery habitat for larvae, juveniles and subadults, and/or some amount of foraging habitat for mature adults. FHOC are geographic locations which are particularly critical to the survival of a species. Determination of the amount of habitats (spawning, nursery, subadult, adult residence, and adult migration routes) described in Subsection 1.4.1.1 that should be classified as FHOC may be difficult.

Examples of FHOC include: any habitat necessary for the species during the developmental stage at which the production of the species is most directly affected; spawning sites for anadromous species; benthic areas where herring eggs are deposited; primary nursery areas; submerged aquatic vegetation in instances when species are determined to be “dependent” upon it; and inlets such as those located between the Atlantic Ocean and bays or sounds, which are the only areas available for providing ingress by larvae spawned offshore to their estuarine nursery areas.

The extent of habitats or FHOC for a species may depend on factors such as habitat bottlenecks, the current stock size and/or the stock size for which a species Management Board and Technical Committee establishes targets, etc. Given the current state of knowledge with regard to the relationship between habitat and production of individual species, this information may not be available for many species.

If known, the historical extent of FHOC should also be included in this subsection, in order to establish a basis for Subsection 1.4.1.3. Use of GIS is encouraged to depict the historical and current extent of HAPCs, and determine the amount of loss/degradation, which will assist in targeting areas for potential restoration.

1.4.1.3: Present Condition of Habitats and Fish Habitat of Concern

This subsection should include, to the extent the information is available, quantitative information on the amount of habitat and FHOC that are presently available for the species, and information on current habitat quality. Reasons for reduction in areal extent (either current or historical), should be addressed, for example, “dam construction has eliminated twenty percent of historical spawning habitat” (ASMFC, 2008), “forage habitat bottleneck has reduced the young-of-year populations by thirty percent”, or “fishing gear continues to disturb fifty percent of the forage habitat”, etc.

Any habitats or FHOC that have diminished over time due to habitat bottlenecks should be incorporated to the extent information is available. Habitat bottlenecks can occur due to natural disasters, fishing disturbance, impacts of development, or other complex processes that can cause habitat shifts. This subsection can further address options to reverse or restore current known habitat bottlenecks. All current threats to the species’ habitat should be discussed in this subsection. If known, relative impacts from these activities should be identified and prioritized. For example, addressing hydrological alterations and their impacts are a high priority for anadromous species. These may include freshwater inflow/diversions; changes in flows due to hydropower, flood control, channel modifications, or surface/aquifer withdrawals; and saltwater flow or salinity changes due to reductions in freshwater inflows or deepening of navigation channels, which facilitate upstream salinity increases. Threats should also be assessed for their effect on the ability to recreationally and commercially harvest, consume, and market the species (e.g., heavy metals or chemical contamination which results in the posting of consumption advisories, or prohibition of commercial fisheries for a species, e.g. striped bass in the Hudson River, NY).

This subsection will serve as a basis for the development of recommended or required actions to protect the species' habitat, which will be outlined in Section 4.4. For example, the effectiveness of water quality standards should be reviewed in this subsection. If they are ineffective or inappropriate at protecting water quality at a level appropriate to assure the productivity and health of the species, then a recommendation should be included under the recommendations section (Section 4.4) for improvement of water quality standards.

Purpose of this Report

Although habitat information is required for each FMP, the amount of information compiled for each species varies, as does the extent of the underlying habitat-related science. Also, FMPs are written and amended as management needs arise, and the frequency of updates is not consistent between plans. Consequently, FHOC designations range from non-existent to specific and recent. This report was initiated to assess the current FHOC designations and make updates, clarifications, and improvements where possible.

The Habitat Committee drafted text descriptions of FHOC for each Commission-managed species drawing on information from the current description of FHOC in the FMPs, species fact sheets, other ASMFC publications, and current literature. Descriptions were reviewed and modified by the species technical committees for accuracy and approval.

FHOC will not be designated for species managed jointly with the Councils, instead deferring to federal designations for EFH and HAPCs. FHOCs will be designated on a case by case basis for ASMFC species which may be listed under the Endangered Species Act (the presumption being that ASMFC would still be responsible for management of the species, once it is declared recovered).

As FMPs and other Commission documents are updated, 'Habitat Areas of Particular Concern (HAPC)' will be replaced with 'Fish Habitats of Concern (FHOC)' as appropriate.

American Eel Fish Habitats of Concern

Although no current anthropogenic threats to the functional health of the Sargasso Sea have been reported (aside from climate change), it is a FHOC for spawning adults and eggs because this is where reproduction for the panmictic population occurs exclusively. *Sargassum* seaweed was being harvested in U.S. waters by surface trawling primarily by one company, but such harvest has ceased. Historically, the harvesting of *Sargassum* began in 1976, but only occurred in the Sargasso Sea since 1987. Since 1976, approximately 44,800 dry pounds of *Sargassum* were harvested, 33,500 pounds of which were from the Sargasso Sea (SAFMC 1998). It is unknown whether this harvest had a direct or indirect influence on American eel mortality. Harvesting *Sargassum* was eliminated in the South Atlantic Exclusive Economic Zone and state waters on January 1, 2001, through a management plan adopted by the South Atlantic Fishery Management Council (SAFMC 1998). The extent of eel bycatch in these operations was not documented.

The drift of leptocephalus larvae from the Sargasso Sea towards the Atlantic coast may be impacted by changes in ocean currents. Such changes have been predicted to be possible due to climate change (Knights 2003, Caesar et al. 2018, Thornalley et al. 2018, Peng et al. 2022). The potential impact on the drift of larvae is unknown at this time, but the predicted weakening and positioning of the Gulf Stream (Ezer 2015, Rypina et al. 2016) may reduce larval transport to coastal and fresh waters. Currents,

primary production, and potential influence of toxins transferred from the adults to the eggs influence the success of hatch, larval migration, feeding, and growth.

Glass eel survival (growth, distribution, and abundance) on the continental shelf is probably impacted by a variety of activities. Channel dredging, shoreline alterations, and overboard dredged material disposal are common throughout the Atlantic coast, but currently the effects on glass eels are unknown. Additionally, these activities, along with impacts from mobile fishing gear, may damage American eel benthic habitat. However, the significance of this impact also remains unknown. Changes in salinity in embayments, as a result of dredging projects, could alter American eel distribution.

Elver and yellow eel abundance is impacted by physical changes in the coastal and tributary habitats. Lost wetlands or access to wetlands and lost access to the upper reaches of tributaries have significantly decreased the availability of these important habitats with wetland loss estimated at 54% (Tiner 1984) and Atlantic coastal tributary access loss or restriction to American eel nursery habitats estimated at 84% (Busch et. al 1998).

Habitat factors are probably impacting the abundance and survival of elver, yellow, and silver eel life stages. The nearshore, embayments, and tributaries provide important feeding and habitat for growth. The availability of these habitats influences the density of the eels and may influence the determination of sex. Therefore, since females may be more common in lower density settings (Vladykov 1966; Columbo and Rossi 1978; Liew 1982; Holmgren and Mosegaard 1996; Roncrati et al. 1997; Krueger and Oliveira 1999) it is crucial that the quantity and quality of these habitats be protected and restored (including upstream access). The blockage or restriction to upstream migration caused by dams reduces or restricts the amount of available habitat to support eel distribution and growth, and therefore tributary headwaters are a particular FHOC. Fish that succeeded to reach upstream areas may also face significant stresses during downstream migration. For example, if eel have to pass through turbines, mortality rates can range from 10 – 60% (J. McCleave, U. of Maine, personal communication) and the amount of injury is not well documented. In the future, it is possible that “fish-friendly” turbines which provide much higher survival rates for American eels may greatly reduce this source of mortality (Peter Sturke and Corey Chamberlain, Dominion Energy, personal communication).

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American Lobster Fish Habitats of Concern

There has been widespread increase in the area and duration of stressful water temperatures (>20°C) throughout Southern New England inshore waters (ASMFC 2010, ASMFC 2020). This loss of optimal thermal habitat in inshore waters throughout this region has caused the stock to contract into deeper waters. Furthermore, young-of-year recruitment throughout historically productive inshore areas have shown dramatic declines throughout the past two decades are now at sustained low levels. Much of the Southern New England fishery has moved to deeper offshore areas in this region. The contraction of

thermal habitat in Southern New England to rising ocean temperatures is a major concern for this species. The Gulf of Maine is still within the optimal temperature range for American lobster, though it is warming at unprecedented rates and there have been recent declines in young-of-year recruitment and older juvenile indices in recent years (ASMFC 2015, ASMFC 2020). Though the Gulf of Maine/Georges Bank stock is still near a time series high level of reference abundance, declines in recruitment and other older life stage indices have prompted ASMFC to consider management changes to protect spawning stock biomass. The Gulf of Maine will be monitored closely over the coming years to detect population changes, though other than concerns of recent declines, continues to be in generally good condition. In contrast, the Southern New England population is at historic low levels and a major concern is lack of optimal thermal habitat for all life stages.

Other American lobster FHOCs include gravel, cobble, boulder, and embedded rock for young-of-year, juvenile, and adult life stages. Areas where these habitats are limited and in close proximity to offshore shoals are susceptible to various types of anthropogenic impact. American lobster metamorphose through four larval stages before settling to the bottom. Research has shown they need shelter providing habitat to protect them from predators during this vulnerable time (Wahle and Steneck 1991, Wahle and Incze 1997). These shallow water cobble/boulder areas are critical to protect from coastal development. Furthermore, egg-bearing female lobsters tend to aggregate in offshore and nearshore shoal areas (Campbell 1990, Carloni and Watson 2018, Jury et al. 2019). This likely provide access to warm water for brooding eggs and close proximity to deep offshore areas for releasing larvae. Areas such as Grand Manan, Canada; Monhegan Island, Maine; Isles of Shoals, Maine/New Hampshire; and Georges Bank have all documented large aggregations of female reproductive lobsters. These areas need to be taken into consideration with any coastal development.

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Atlantic Croaker Fish Habitats of Concern

FHOCs for juvenile Atlantic croaker include low salinity estuarine habitats along the Atlantic coast in early spring, to higher salinity estuarine habitats in summer and early fall, in areas with mud and detrital bottoms rich in benthic prey and dissolved oxygen (DO) levels consistently higher than 2.0 mg/L. Estuaries such as Pamlico Sound and Chesapeake Bay serve as important nursery and spawning areas (Schloesser and Fabrizio 2018). Adult Atlantic croaker are also dependent upon estuarine habitat in spring through fall, in areas with salinities ranging from 3-27 ppt and DO greater than 2.0 mg/L, but are less limited than juveniles by bottom substrate type due to an ontogenetic diet shift.

Along the Atlantic coast, juvenile Atlantic croaker are typically found in estuaries. Young-of-year less than 50 mm total length (TL) inhabit low salinity or upriver areas (Haven 1957; Dahlberg, 1972; Chao and Musick 1977; White and Chittenden 1977; Miller et al. 2003). Juveniles are positively correlated with mud bottoms that have large amounts of detritus and high amounts of benthic prey (Cowan and Birdsong 1985). Juveniles migrate downstream as they develop; by late fall, most juveniles emigrate out of the estuaries to coastal ocean habitats (Migliarese et al. 1982). In spring (after spending winter in the coastal ocean) through fall, adult Atlantic croaker are found in estuaries over muddy and sandy substrates, seagrass beds, and near oyster, coral and sponge reefs (White and Chittenden 1977; TSNL 1982).

Studies have shown that Atlantic croaker are virtually absent from waters with DO levels less than 2.0 mg/L, suggesting they are very sensitive to the amount of DO present (Eby and Crowder 2002). This can become a factor that limits habitat quantity and quality in the warmer summer months in estuarine systems that experience nutrient enrichment and eutrophication issues. Bottom-tending fishing gear may also impact Atlantic croaker FHOCs (Able et al. 2017, Odell et al. 2017).

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Atlantic Menhaden Fish Habitats of Concern

Estuarine-subtidal and riverine-tidal systems are FHOCS for larval and early juvenile life stages of Atlantic menhaden. Atlantic menhaden production is heavily dependent on estuarine-subtidal and riverine-tidal systems (constrained to the upstream limit of the tidal zone) and the water quality of those systems is threatened by climate change, toxicants, nutrient pollution, and altered freshwater flows. A further threat to estuarine water quality is lower DO associated with increasing average annual temperatures due to climate change. Both the Neuse River Estuary and Chesapeake Bay have been prone to hypoxic or anoxic conditions during summer (Cooper and Brush 1991), resulting in significant episodic mortality of juvenile Atlantic menhaden, particularly in the Neuse (Carpenter and Dubbs 2012).

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Atlantic Striped Bass Fish Habitats of Concern

Adult striped bass are highly concentrated and most vulnerable to exploitation in their offshore wintering grounds (historically from the Outer Banks of North Carolina northward through Virginia and Maryland waters, but in recent years shifting more northward and further offshore) and riverine spawning areas (for the Atlantic migratory stock, most major coastal rivers from the Roanoke in North Carolina through the Kennebec in Maine). While exploitation of striped bass aggregations impacts the spawning stock, the determinant factor in striped bass abundance (year class strength) is the survival of their eggs and larvae. For this reason, spawning areas are a FHO for striped bass.

Striped bass spawn in freshwater or nearly freshwater of Atlantic Coast rivers and estuaries. Such sites provide the critical ecological function of reproduction; are sensitive to anthropogenic impacts such as dam emplacement, nutrient and sediment loading, and pollution; are susceptible to navigational dredging and other coastal development activities; and are relatively small in extent and extremely rare in comparison to the areal extent of other migratory striped bass habitats. According to Hill et al. (1989) and citations within: striped bass spawn above the tide in mid-February in Florida but in the St. Lawrence River they spawn in June or July. The bass spawn in turbid areas as far upstream as 320 km from the tidal zone. The tributaries of the Chesapeake Bay are the primary spawning areas for migratory striped bass, but other major areas include the Hudson River, Delaware Bay, and the Roanoke River. Spawning is triggered by increased water temperature. Spawning occurs between 10 and 23°C, but optimal temperature for spawning is between 17 and 19°C.

A temperature range of 17-19°C is important for egg survival as well as for maintaining appropriate DO levels (Bain and Bain 1982). Minimum water velocities of 30 cm/s are needed to keep the eggs suspended, and fluctuations in the water velocity cause changes in the size of the oil globule surrounding the eggs (Albrecht 1964). Without the buoyancy, the eggs sink to the bottom, where the sediment may smother them. It is possible for the eggs to hatch if the sediment is coarse and not sticky or muddy, but survival is limited (Bayless 1968). Eggs hatch from about 30 hours at 22°C to about 80 hours at 11°C (Hill et al. 1989).

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Atlantic Sturgeon Fish Habitats of Concern

The FHOCS for Atlantic sturgeon include the NMFS CH designations for the five discrete population segments (DPS) which comprise the species range. The designations can be found here: <https://www.fisheries.noaa.gov/action/critical-habitat-designation-atlantic-sturgeon>. The designations include the reaches of Atlantic Coast rivers where spawning migrations, egg deposition, and larval and early juvenile nursery habitats occur. Threats to these habitats are multiple and include altered river flows and thermal regimes due to hydropower operations, water withdrawals, and increased incidence of storms owing to climate change; low DO, ocean acidification, altered salinity due to navigational dredging, and ship strikes, among others.

Information regarding Atlantic sturgeon use of spawning reaches at a finer scale has increased since CH designation in 2017 as a result of ongoing long-term studies using acoustic telemetry of sexually mature Atlantic sturgeon (e.g., see Breece et al. 2021, for the Hudson River population; Hager et al. 2020 for the York River population in Virginia; and additional information is currently being gathered for North Carolina rivers under a NMFS Section 6 grant, see McCargo et al. 2019). These studies may allow further refinement of Atlantic sturgeon FHOCS beyond what is presently designated as CH by NMFS.

When the initial CH designations were made, the NMFS indicated that they believed they did not have enough data to designate estuarine or offshore habitats where sturgeon aggregations occurred as CH for reasons that were not unequivocally associated with particular physical or biological features. Specifically, they stated, “We cannot designate critical habitat based on the presence of the species alone. Therefore, while we acknowledge there is literature that identifies aggregation areas where Atlantic sturgeon are generally found, it does not provide specificity as to the purpose of the aggregations or the features that support those purposes. Therefore, we do not believe it provides the information we need to meet the statutory and regulatory requirements to designate critical habitat” [Federal Register / Vol. 82, No. 158 / Thursday, August 17, 2017 / Rules and Regulations, Page 39172].

While we do not disagree with the NMFS conclusions with respect to sturgeon aggregations and CH designation(s), the Commission believes that sufficient justification and data currently exist to designate habitats FHOCS for ASMFC purposes, in particular Atlantic sturgeon nursery habitats within estuaries outside of the current NMFS CH designations, where fishery-independent sampling has persistently shown juveniles to be present. Most natal rivers discharge into estuaries, and these areas, part of the migratory pathway for juveniles to the ocean, are of significance for juveniles as they migrate from their birthplace. The NMFS CH designations in most cases already include the estuarine portions of many rivers (i.e., Haverstraw Bay as documented as a significant Atlantic sturgeon nursery area, see Pendleton and Adams 2021; and the Delaware River estuary, see Hale et al. 2016); however, we believe additional

estuarine areas further downstream merit FHO status, based on the persistent and documented presence of juvenile Atlantic sturgeon within them and their importance as part of the migratory pathway.

Our recommendations are based in large measure on the comprehensive review of Atlantic sturgeon life history by Hilton et al. (2016), supplemented by additional published information and in some cases unpublished data (specific references cited below). We also rely on the review by Dunton et al. (2010) of Atlantic sturgeon within the Northwest Atlantic Ocean as derived from five fishery-independent surveys. In particular, they note: “Our analysis of habitat preferences indicated that depth was the primary environmental characteristic defining the Atlantic sturgeon distribution. Thus, essential habitat for juvenile marine migrant Atlantic sturgeon can broadly be defined as coastal waters <20 m depth, and it is concentrated in areas adjacent to estuaries such as the Hudson River–NY Bight, Delaware Bay, Chesapeake Bay, Cape Hatteras, and Kennebec River. This narrow band of shallow water appears to represent an important habitat corridor and potential migration path.”

These estuarine FHO areas which were not included within the NMFS CH designations include (from north to south): Long Island Sound (Dunton et al. 2010, citing Bain et al. 2000 and Savoy and Pacileo 2003); Delaware Bay (Dunton et al. 2010; Brundage and O’Herron 2009; Breece et al. 2018); Chesapeake Bay (Musick 2005; Greenlee et al. 2017), including the Nanticoke River-Marshyhope Creek estuary (see Secor et al. 2022); western Albemarle Sound (based on a decades-long time series documenting young-of-year production and subadult habitat use, from captures in the NCDMF fishery-independent striped bass gill net survey, NCDMF unpublished data; and Armstrong 2003); Pamlico Sound (Atlantic sturgeon use also documented through NCDMF fishery-independent unpublished data); and Winyah Bay (Collins et al. 2000, Simpson et al. 2015, Crane 2021). Such estuarine areas are important not only as nursery habitat for juveniles produced within natal rivers tributary to these estuaries, but also for juveniles and subadults which may migrate into them from other spawning populations (e.g., see Waldman et al. 2013).

Finally, several long-term fishery-independent data time series (Laney et al. 2007 and unpublished data; Dunton et al. 2010), as well as analysis of fishery-dependent data derived from observation of Atlantic sturgeon bycatch (e.g., see Stein et al. 2004, ASMFC 2007, and NMFS 2022) have consistently documented aggregation sites for subadult and adult Atlantic sturgeon in the nearshore marine environment. In the spring and fall, juveniles are found off the Rockaways and Sandy Hook (Dunton et al. 2010, 2015, unpublished acoustic data). We believe these areas also merit designation as FHO. Stein et al. (2004) mapped multiple areas from Cape Hatteras northward. Dunton et al. (2010) also mapped multiple sites. Analysis of the complete time series (1988-2016) of data from Atlantic sturgeon captures during the Cooperative Winter Tagging Cruises (see Laney et al. 2007) by Wickliffe et al. (2019) further documents the Atlantic sturgeon “hot spots” in the nearshore Atlantic Ocean off NC and VA. Such aggregation sites are not only used by sturgeon from nearby natal rivers, but are also frequented by sturgeon from other DPSs as well (Wirgin et al. 2015, Kazyak et al. 2021). “Hot spots” should be designated FHOCs once specific locations are identified.

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Black Drum Fish Habitats of Concern

Black drum are habitat generalists, so no FHOCS are designated at this time. At various life stages they can be found in the following habitats: tidal freshwater, estuarine emergent vegetated wetlands (flooded salt marshes, brackish marshes, and tidal creeks), estuarine scrub/shrub (mangrove fringe), submerged rooted vascular plants (seagrasses), oyster reefs and shell banks, unconsolidated bottom (soft sediments), ocean high salinity surf zones, and artificial reefs. The estuarine system as a whole serves as the species' primary nursery area. In the future, we may elect to specify documented spawning sites as FHOCS for black drum, should acoustic surveys be able to accurately pinpoint such habitats (e.g., see Rice et al. 2016).

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Cobia Fish Habitats of Concern

Important habitats for cobia include estuarine and nearshore spawning areas and live reefs and artificial structure. Good water quality in high salinity sounds in South Carolina and Virginia where spawning aggregations occur and eggs and larvae develop are critical for the sub-population of cobia that spawn inshore. Oceanic spawning sites off Virginia to Georgia may extend from just outside inlets and sounds to the Gulf Stream (Brown-Peterson et al. 2001). Offshore spawning was determined through the

presence of eggs and larvae, thus exact locations are not known but cobia often associate with structure provided by live reefs, artificial reefs, oil platforms, and navigation markers.

Designation of FHOCS should be considered for Port Royal Sound, St. Helena Sound, Beaufort Inlet, Barden's Inlet, Hatteras Inlet, Pamlico Sound, and the mouth and lower portion of the Chesapeake Bay, especially for the months of April through June, when extensive eggs and larvae have been documented (Lefebvre and Denson 2012). Movement data show that cobia can exhibit site fidelity to spawning areas, returning to the same sites across multiple years. Four genetically distinct groups of cobia are found along the Atlantic coast, two of which are associated with spawning inshore in South Carolina and inshore Virginia/North Carolina (Darden et al. 2018), further supporting the areas listed above. Additional locations could be considered as potential FHOCS in the future as research on cobia spawning habitat and movements expands.

As for many species, protection of spawning habitat can help to ensure population viability. Seasonal cobia migrations that occur along coasts, and between inshore and offshore waters, are driven by water temperature; thus, interannual variation in water temperature, and climate change, could affect the timing of spawning and recruitment (Crear 2021). Protection of spawning habitat is warranted in areas subject to urbanization, eutrophication, and dredging. In the Chesapeake Bay, one of the spawning sites of cobia, nutrients along with warmer water has led to more frequent and severe hypoxic events (e.g., Hagy et al. 2004).

Along the Atlantic coast, cobia are divided into two stocks at the Florida/Georgia border (GMFMC 2014) with a mixing zone from southern Georgia to Cape Canaveral FL (Darden et al. 2014, Perkinson et al. 2019). The east coast of Florida is considered a migratory zone and is managed by the Gulf of Mexico Fishery Management Council. Hence, Florida is not considered in habitats of concern for the ASFMC.

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Horseshoe Crab Fish Habitats of Concern

Habitat requirements change throughout the horseshoe crab life cycle, extending from intertidal beach fronts and tidal flats in coastal embayments for eggs and larvae, to the edge of the continental shelf for adults. The distribution of high quality spawning beaches, which are exposed to minimal human disturbance, presents a potential bottleneck to reproductive success for this species. Beach areas that provide spawning habitat are Fish Habitats of Concern for adult horseshoe crabs. Spawning adults prefer sandy beaches in low wave energy areas, usually within bays and coves. The ideal beach habitat for spawning horseshoe crabs includes a sufficient depth of porous, well-oxygenated sediments to provide a suitable environment for egg survival and development, although nest depth and location on the beach vary among the Atlantic states depending on local habitats available for spawning. Spawning beach characteristics can vary along the coast, with beaches in Florida typically having a finer grain size and larger area of tidal inundation and saturated zones. This causes the sediment to hold more water, though these beaches have also shown to hold oxygen farther from the water line than in Delaware (Penn and Brockman 1994).

Juvenile horseshoe crabs use nearshore, shallow water, and intertidal flats as they develop. Larger juveniles and adults use deep water habitats to forage for food, but these are not considered Fish Habitats of Concern. Of these habitats, the beaches are the most critical (Shuster 1996). Optimal spawning beaches may be a limiting reproductive factor for the horseshoe crab population.

The densest concentrations of horseshoe crabs in New Jersey occur on small sandy beaches surrounded by salt marshes or bulkheaded areas (Loveland et al. 1996). The spawning beaches within Delaware Bay are critical habitat because they support the highest density of spawning horseshoe crabs along the U.S. Atlantic Coast. Prime spawning beaches within the Delaware Bay consist of sand beaches between Maurice River and the Cape May Canal in New Jersey and between Bowers Beach and Lewes in Delaware (Shuster 1996). Horseshoe crab eggs play an important ecological role in the food web for migrating shorebirds and the Delaware Bay is an important stopover location for the threatened red knot. Good spawning habitat is widely distributed throughout Maryland's Chesapeake and coastal bays, including tributaries. In South Carolina and Georgia, horseshoe crabs spawn in substantial numbers on a variety of substrates including sandy beaches, salt marshes, and coarse-grained oyster shell. These sites

are also known stopover locations for red knot. While viability of eggs deposited in salt marshes are slightly reduced compared to the sandy beaches, horseshoe crabs apparently use these habitats for spawning frequently in South Carolina (Kendrick et al. 2021). Florida has less dense concentrations of horseshoe crabs but there are still prominent spawning populations on both the Atlantic and Gulf Coasts. The Indian River Lagoon has the highest densities of horseshoe crabs in Florida.

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Jonah Crab Fish Habitats of Concern

Currently there is not enough information available to designation Jonah crab FHO.

Northern Shrimp Fish Habitats of Concern

Deep, muddy basins (generally 90-180 m, but found down to 300 m) in the southwestern region of the Gulf of Maine act as cold-water refuges (4-6°C) for adult shrimp during periods when most water in the Gulf reaches sub-optimal temperatures and are therefore a FHO. Sub-optimal temperatures are considered over 8°C, with temperatures over 12°C being considered highly stressful for northern shrimp and potentially causing mortality if exposed to these temperatures over longer time periods (ASMFC 2017, Richards and Hunter 2021). Temperature serves as a habitat bottleneck for this species (Apollonio 1986).

Nearshore water provides habitat for larval and juvenile stages of northern shrimp, however the specific habitat requirements and spatial distribution are not well known (ASMFC 2017).

See Figure 10 in Amendment 3 of the northern shrimp FMP (ASMFC 2017) and Figure 6 in Richards and Hunter 2021, showing temperature regimes and shrimp populations respectively, further than 10 miles from shore. Also see "Offshore Habitat Preferences" in Apollonio et al. 1986, p. 18 for general discussion.

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Red Drum Fish Habitats of Concern

Red drum FHOCS vary based on life stage. FHOCS for early juveniles include protected marsh (tidal fresh, brackish, and salt water) and tidal creek habitat (Peters and McMichael 1987; Wenner, 1992; FWCC 2008). Subadults, while they can use a wide range of estuary habitats, exhibit highest abundances and apparent productivity in association with submerged aquatic vegetation, oyster reef, tidal creeks, and marsh (tidally fresh, brackish, and salt) habitats (Pafford et al. 1990; Wenner 1992; Adams and Tremain 2000). Highest concentrations tend to be found in areas with dense reefs and/or shell hash in association with tidally flooded marsh habitat where these habitats exist. FHOCS for adults include inlets, channels, sounds, outer bars, and within estuaries in some areas (e.g. Indian River Lagoon, FL), due to their importance for red drum spawning activity (Murphy and Taylor 1990; Johnson and Funicelli 1991; Reyier et al. 2011).

A species' nursery areas are indisputably essential to its continuing existence. Nursery areas for red drum can be found throughout estuaries. Larvae and early juveniles seemingly prefer shallow waters of varying salinities that offer a certain degree of protection. Such areas include coastal marshes, shallow tidal creeks, bays, tidal flats of varying substrate, tidal impoundments, and seagrass beds (Pattillo et al. 1997; Holt et al. 1983; Rooker and Holt 1997, Rooker et al. 1998; Levin et al. 2001). Since red drum larvae and juveniles are ubiquitous in such environments, it is impossible to designate specific areas as deserving more protection than others. Moreover, these areas are not only nursery areas for red drum, but they fulfill the same role for numerous other resident and estuarine-dependent species of fish and invertebrates, especially other sciaenids. Similarly, subadult red drum habitat extends over a broad geographic range and adheres to the criteria that define HAPCs and FHOCS. Subadult red drum are found throughout tidal creeks and channels of southeastern estuaries. The subadults utilize submerged aquatic vegetation, tidal creeks, oyster reefs as well as tidally fresh, brackish, and salt marsh (Pafford et al. 1990; Wenner 1992; Adams and Tremain 2000). The entire estuarine system, from the lower salinity reaches of rivers to the mouth of inlets, is vital to the continuing existence of this species.

While there is currently no supporting evidence to suggest a particular habitat type limits red drum populations, it should be noted again that seagrass beds are vitally important for newly settled individuals, and oyster reefs, tidal creeks, and coastal rivers are of critical importance to red drum during the juvenile and subadult life stages. Data from Georgia's Marine Sportfish Health Survey indicate over 80% of juvenile red drum in Georgia waters are associated with shell habitats. Changes in water flow and conditions due to watershed activities may also limit recruitment of larvae at a local scale.

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River herring and Shad: Alewife (*Alosa aestivalis*), Blueback Herring (*Alosa pseudoharengus*), American Shad (*Alosa sapidissima*), and Hickory Shad (*Alosa mediocris*) Fish Habitats of Concern

NOTE: Due to the dearth of information on FHOCS for alosine species, this information is applicable to American shad, hickory shad, alewife, and blueback herring combined. Information about one alosine species may be applicable to other alosine species and is offered for comparison purposes only. Certainly, more information should be obtained at individual FHOCS for each of the four alosine species.

Metapopulation structure, meaning groups of the same species that are spatially separate, but may interact at some level, is evident in river herring. Metapopulation structure is important because individuals may be locally adapted. Adults frequently return to their natal rivers for spawning but some limited straying occurs between rivers (Jones 2006, ASMFC 2009). Critical life history stages for American shad, hickory shad, alewife, and blueback herring, are the egg, prolarva (yolk-sac or pre-feeding larva), post-larva (feeding larva), and early juvenile (through the first month after transformation) (Klauda et al. 1991a, b). Spawning grounds and nursery habitat where these critical life stages grow and mature broadly includes freshwater ponds, rivers, tributaries, and inlets. The substrate preferred for spawning varies greatly and can include gravel, detritus, and submerged aquatic vegetation. Blueback herring prefer swifter moving waters than alewives do (ASMFC 2009). Nursery areas include freshwater and semi-brackish waters. Access to these spawning and nursery habitats may be blocked or impeded by dams or other barriers. Juvenile alosines, which leave the coastal bays and estuaries prior to reaching adulthood, also use the nearshore Atlantic Ocean as a nursery area (ASMFC 1999).

See [Greene et al. 2009](#) for tables that detail environmental, temporal, and spatial values/factors affecting the distribution of alewife, blueback herring, American shad, and hickory shad.

Habitat quantity

Thousands of kilometers of historic anadromous alosine habitat have been lost due to development of dams and other obstructions to migration. In the 19th century, organic pollution from factories created zones of hypoxia or anoxia near large cities (Burdick 1954, Talbot 1954, Chittenden 1969). Gradual loss of spawning and nursery habitat quantity and quality and overharvesting are thought to be the major causative factors for population declines of American shad, hickory shad, alewife, and blueback herring (ASMFC 1999).

It is likely that American shad spawned in all rivers and tributaries throughout the species' range on the Atlantic coast prior to dam construction in this country (Colette and Klein-MacPhee 2002). While precise estimates are not possible, it is speculated that at least 130 rivers supported historical runs; now there are fewer than 70 systems that support spawning. Individual spawning runs may have numbered in the hundreds of thousands. It is estimated that runs have been reduced to less than 10% of historic sizes. The 2020 American Shad Benchmark Stock Assessment Summary reported that the percentage of historic riverine habitat that is currently unobstructed varies from 4-100% in 23 river systems from Maine to Florida, with 12 systems at 75% or less unobstructed and seven river systems at 50% or less

unobstructed (see table in [ASMFC 2020a](#)). One recent estimate of river kilometers unavailable for spawning is 4.36×10^3 compared to the original extent of the runs. This is an increase in available habitat as compared with estimates from earlier years, with losses estimated at 5.28×10^3 in 1898 and 4.49×10^3 in 1960. The increase in available habitat has largely been due to restoration efforts and enforcement of pollutant abatement laws (Limburg et al. 2003).

Some states have general characterizations of the degree of habitat loss, but few studies have actually quantified impacts in terms of the area of habitat lost or degraded (ASMFC 1999). It has been noted that dams built during the 1800's and early to mid-1900's on several major tributaries to the Chesapeake Bay have substantially reduced the amount of spawning habitat available to American shad (Atran et al. 1983, CEC 1988), and likely contributed to long-term stock declines (Mansueti and Kolb 1953). North Carolina characterized river herring habitat loss as "considerable" from wetland drainage, stream channelization, stream blockage, and oxygen-consuming stream effluent (NCDENR 2000). Sixteen state and cooperative river basin habitat plans that provide greater local detail on American shad habitat and are available at <http://www.asmfc.org/species/shad-river-herring>.

Some attempts have been made to quantify existing or historical areas of anadromous alosine habitat, including spawning reaches. Most recently, the American shad benchmark assessed and compared the amount of currently available habitat for American shad in Atlantic coast rivers to historic habitat availability (ASMFC 2020b). See section 2.7.2 for a description of this analysis. Results are presented for individual systems in each system stock section (Section 3), and overall coastwide results are provided in section 4.4.2. Previously, Maine estimated that the American shad habitat area in the Androscoggin River is 2,111 acres. In the Kennebec River, Maine, from Augusta to the lower dam in Madison, including the Sebasticook and Sandy rivers, and Seven Mile and Wesserunsett streams, there is an estimated 6,510 acres of American shad habitat and 24,606 acres of river herring habitat. Lary (1999) identified an estimated 1,877 acres of suitable habitat for American shad and 6,133 acres for alewife between Jetty and the Hiram Dam along the Saco River, Maine. Above the Boshers Dam on the James River, Virginia, habitat availability was estimated in terms of the number of spawning fish that the main-stem area could support annually, which was estimated at 1,000,000 shad and 10,000,000 river herring (Weaver et al. 2003).

Although many stock sizes of alosine species are decreasing or remain at historically low levels, some stock sizes are increasing. It has not been determined if adequate spawning, nursery, and adult habitat presently exist to sustain stocks at recovered levels (ASMFC 1999).

Habitat quality

Concern that the decline in anadromous alosine populations is related to habitat degradation has been alluded to in past evaluations of these stocks (Mansueti and Kolb 1953, Walburg and Nichols 1967). This degradation of alosine habitat is largely the result of human activities. However, it has not been possible to rigorously quantify the magnitude of degradation or its contribution to impacting populations (ASMFC 1999).

Of the habitats used by American shad, spawning habitat has been most affected. Loss due to water quality degradation is evident in the northeast Atlantic coast estuaries. In most alosine spawning and nursery areas, water quality problems have been gradual and poorly defined; it has not been possible to link those declines to changes in alosine stock size. In cases where there have been drastic declines in alosine stocks, such as in the Chesapeake Bay in Maryland, water quality problems have been implicated, but not conclusively demonstrated to have been the single or major causative factor (ASMFC 1999).

Toxic materials, such as heavy metals and various organic chemicals (i.e., insecticides, solvents, herbicides), occur in anadromous alosine spawning and nursery areas and are believed to be potentially harmful to aquatic life, but have been poorly monitored. Similarly, pollution in nearly all of the estuarine waters along the East Coast has certainly increased over the past 30 years, due to industrial, residential, and agricultural development in the watersheds (ASMFC 1999).

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Spot Fish Habitats of Concern

FHOCs for larval spot include brackish and saltwater marsh as well as submerged aquatic vegetation in mesohaline and polyhaline waters. From Delaware to Florida, primary nursery habitat for juveniles includes low salinity bays and tidal marsh creeks with mud and detrital bottoms that contain their epifaunal and infaunal prey. Seagrass habitats, where present, appear to be most important for young-of-year spot in early spring. In the Chesapeake Bay and North Carolina, juveniles can be found in eelgrass. FHOCs for adult spot include tidal creeks and estuarine bays with mud and detrital substrates which support abundant prey (epifauna and benthic infauna). Bottom-tending fishing gear may impact spot FHOCs (Odell et al. 2017).

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Spotted Seatrout Fish Habitats of Concern

Submerged aquatic vegetation, salt marsh, and oyster reefs, especially where submerged aquatic vegetation is not available, are FHOCS for spotted seatrout. Seagrass beds provide important habitat for both juvenile and adult spotted seatrout, but are in decline along much of the Atlantic coast (Orth et al. 2006; Waycott et al. 2009; Adams et al. 2019; Morris et al. 2022). Salt marsh and oyster reef habitats provide FHOCS for juvenile and adult spotted seatrout, particularly in areas where submerged aquatic vegetation naturally does not occur. These habitats are also in decline, and are under continuing threats due to coastal development, sea level rise, and ocean acidification. Spawning takes place on or near seagrass beds, as well as sandy banks, natural sand, shell reefs, near the mouths of inlets, and off the beach (Daniel 1988; Brown-Peterson and Warren 2002). Environmental conditions in spawning areas may affect growth and mortality of egg and larvae, as sudden salinity reductions cause spotted seatrout eggs to sink, thus reducing dispersal and survival (Holt and Holt 2002).

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Tautog Fish Habitats of Concern

All structured habitats that are used by juvenile and adult tautog (e.g., outcrops, rock piles, boulders, shells, reef, hard and soft corals, and sea whips), as well as inlets adjacent to estuaries serving as important refuge and spawning sites are FHOCS. Submerged aquatic vegetation is a FHOCS for larvae, young-of-year, and juveniles.

Weakfish Fish Habitats of Concern

Important habitats for weakfish include estuarine and oceanic nursery and spawning areas distributed along the coast from Maine through Florida. The principal spawning area is from North Carolina to Montauk, NY (Hogarth et al. 1995), although extensive spawning and presence of juveniles has been observed in the bays and inlets of Georgia and South Carolina (D. Whitaker, South Carolina Department of Natural Resources, personal communication) as well as in nearshore areas off North Carolina and Virginia (ASMFC and USFWS, unpublished data; Osborne 2018).

Spawning sites include coastal bays, sounds, and the nearshore Atlantic Ocean. Nursery areas include the upper and lower portions of the rivers and their associated bays and estuaries, as well as nearshore areas in the Atlantic Ocean. While disturbance to a nursery area will affect the overall coastal weakfish population it would be expected to have the greatest impact on the specific sub-population and the local fisheries that depend on it. There is evidence that indicates that weakfish engage in natal homing (Thorrold et al. 2001). Natural geochemical signatures in otoliths indicated that spawning site fidelity ranged from 60 to 81%, comparable to estimates of natal homing in birds and anadromous fishes (Thorrold et al. 2001). That being the case, estuaries with significant concentrations of weakfish juveniles should be designated as FHOCS (i.e., Pamlico Sound in North Carolina; see Barbieri 2016). Egg and larval habitats include the nearshore waters as well as the bays, estuaries, and sounds to which they are transported by currents or in which they hatch.

Juvenile weakfish inhabit the deeper waters of bays, estuaries, and sounds, including their tributary rivers. They also use the nearshore Atlantic Ocean as a nursery area (Osborne 2018). In North Carolina and other states, they are associated with sand or sand/seagrass bottom. In Chesapeake and Delaware Bays, they migrate to the Atlantic Ocean by December.

Adult weakfish reside in both estuarine and nearshore Atlantic Ocean habitats. Warming of coastal waters in the spring keys migration inshore and northward from the wintering grounds to bays, estuaries and sounds. Larger fish move inshore first and tend to congregate in the northern part of the range. Catch data from commercial fisheries in Chesapeake and Delaware Bays and Pamlico Sound indicate that the larger fish are followed by smaller weakfish in summer. Shortly after their initial spring appearance, weakfish return to the larger bays and nearshore ocean to spawn. In northern areas, a greater portion of the adults spends the summer in the ocean rather than estuaries. Weakfish form aggregations and move offshore as temperatures decline in the fall. They move generally offshore and southward. The Continental Shelf from Chesapeake Bay to Cape Lookout, North Carolina, appears to be the major wintering ground. Winter trawl data indicate that most weakfish were caught between

Ocracoke Inlet and Bodie Island, NC, at depths of 18-55 m (59-180 ft). Some weakfish may remain in inshore waters from North Carolina southward.

The quality of weakfish habitats has been compromised largely by impacts from human activities. It is generally assumed that estuarine weakfish habitats have undergone some degree of loss and degradation; however, there are few studies that quantify impacts in terms of the area of habitat lost or degraded. Estuarine nursery habitat is impacted by bottom-tending gear (Odell et al. 2017).

Loss due to water quality degradation is evident in the northeast Atlantic coast estuaries. The New York Bight is one example of an area that has regularly received deposits of contaminated dredged material, sewage sludge and industrial wastes. These deposits have contributed to oxygen depletion and the creation of large masses of anoxic waters during the summer months.

Some habitat losses have likely occurred due to the intense coastal development that has occurred during the last several decades, although no quantification has been done. Losses and/or degradation have likely resulted from dredging and filling activities that have both eliminated shallow water nursery habitat and negatively impacted weakfish spawning activity. Further functional losses have likely occurred due to water quality degradation resulting from point and non-point source discharges. Intensive conversion of coastal wetlands to agricultural use also is likely to have contributed to functional loss of weakfish nursery area habitat.

Other functional loss of riverine and estuarine areas may have resulted from changes in water discharge patterns resulting from withdrawals or flow regulation. Estuarine nursery areas for weakfish, as well as adult spawning and pre-spawning staging areas, may be affected by prolonged extreme conditions resulting from inland water management practices.

Power plant cooling facilities continue to impact weakfish populations. In recent rules regarding these facilities, the Environmental Protection Agency estimates that the number of total weakfish age 1 equivalents lost as a result of entrainment at all transition zone cooling water intake structures in the Delaware Bay is over 2.2 million individuals. Other threats stem from the continued alteration of freshwater flows and discharge patterns to spawning, nursery, and adult habitats in rivers and estuaries. Threats in the form of increased mortality resulting from placement of additional municipal water intakes in spawning and nursery areas will occur, although the impacts may be mitigated to some degree with proper screening.

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